

ITA-2000

**2U Rackmount System Intel
Atom N270 4 LAN, 10 COM, 2
CAN, 16 DIO & PC/104+**

带 Intel Atom N270、4 x LAN、10
x COM、2 x CAN、16 x DIO & PC/
104+ 的 2U 上架式系统

Trusted ePlatform Services

ADVANTECH

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Safety Instructions/ 安全指示

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Do not leave this equipment in an environment unconditioned where the storage temperature under 0° C (32° F) or above 40° C (104° F), it may damage the equipment.
8. The openings on the enclosure are for air convection. Protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
9. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
10. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
11. All cautions and warnings on the equipment should be noted.
12. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
13. Never pour any liquid into an opening. This may cause fire or electrical shock.
14. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
15. If one of the following situations arises, get the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment does not work well, or you cannot get it to work according to the user's manual.
 - The equipment has been dropped and damaged.
 - The equipment has obvious signs of breakage.
16. **CAUTION:** The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. **THE COMPUTER IS PROVIDED WITH CD DRIVES COMPLY STANDARDS INCLUDING IEC 60825.**
18. This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
 - (1) this device may not cause harmful interference, and
 - (2) this device must accept any interference received, including interference that may cause undesired operation.
19. **CAUTION:** Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges.

20. CAUTION: Always ground yourself to remove any static charge before touching the motherboard, backplane, or add-on cards. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.
21. CAUTION: Any unverified component could cause unexpected damage. To ensure the correct installation, please always use the components (ex. screws) provided with the accessory box.

1. 请仔细阅读此安全操作说明。
2. 请妥善保存此用户手册供日后参考。
3. 用湿抹布清洗设备前，请从插座拔下电源线。请不要使用液体或去污喷雾剂清洗设备。
4. 对于使用电源线的设备，设备周围必须有容易接触到的电源插座。
5. 请不要在潮湿环境中使用设备。
6. 请在安装前确保设备放置在可靠的平面上，意外跌落可能会导致设备损坏。
7. 请不要把设备放置在超出我们建议的温度范围的环境，即不要低于 0° C (32° F) 或高于 40° C (104° F)，否则可能会损坏设备。
8. 设备外壳的开口是用于空气对流，从而防止设备过热。**请不要覆盖这些开口。**
9. 当您连接设备到电源插座上，请确认电源插座的电压是否符合要求。
10. 请将电源线布置在人们不易绊到的位置，并不要在电源线上覆盖任何杂物。
11. 请注意设备上的所有警告标示。
12. 如果长时间不使用设备，请将其同电源插座断开，避免设备被超标的电压波动损坏。
13. 请不要让任何液体流入通风口，以免引起火灾或者短路。
14. 请不要自行打开设备。为了确保您的安全，请由经过认证的工程师来打开设备。
15. 如遇下列情况，请由专业人员来维修：
 - 电源线或者插头损坏；
 - 设备内部有液体流入；
 - 设备曾暴露在过于潮湿的环境中使用；
 - 设备无法正常工作，或您无法通过用户手册来使其正常工作；
 - 设备跌落或者损坏；
 - 设备有明显的外观破损。
16. **注意：**计算机配置了由电池供电的实时时钟电路，如果电池放置不正确，将有爆炸的危险。因此，只可以使用制造商推荐的同一种或者同等型号的电池进行替换。请按照制造商的指示处理旧电池。
17. **计算机的光盘驱动符合相应的安全标准，如 IEC 60825 等。**
18. 本品符合 FCC 规则第 15 款限制。操作符合下列两种情况：
 - (1) 此装置不可产生干扰，且
 - (2) 此装置必须接受任何干扰，包括可能导致非预期操作的干扰。
19. **注意：**无论何时进行操作，请务必完全断开机箱电源。不可在电源接通时进行设备连接，以避免瞬间电涌损坏敏感电子元件。
20. **注意：**接触主板、无源底板或附加卡时，请务必使自己接地来移除身体所附的静电。由于现在的电子设备对静电十分敏感，为了安全起见，请使用接地腕环。请将所有电子元件放在无静电的表面或静电屏蔽袋中。
21. **注意：**任何未经验证的组件都可能对设备造成意外损坏。为保证安装正确，请只使用附件盒内提供的组件，如螺丝。

Safety Precaution - Static Electricity/ 安全措施 – 静电防护

Follow these simple precautions to protect yourself from

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Don't touch any components on the CPU card or other cards while the PC is on.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

为了保护您和您的设备免受伤害或损坏，请遵照以下安全措施：

- 操作设备之前，请务必断开机箱电源，以防触电。不可在电源接通时接触 CPU 卡或其他卡上的任何元件。
- 在更改任何配置之前请断开电源，以免在您连接跳线或安装卡时，瞬间电涌损坏敏感电子元件。

A Message to the Customer/ 致客户

Advantech customer services/ 研华为客户提供的服务

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services.

To ensure you get the full benefit of our services, please follow the instructions below carefully.

研华的每一款产品都是严格按照规格生产的。这样，产品的可靠性在恶劣粗糙的工业环境下也可以得到保证。无论您购买的研华产品属于实验室还是工厂层，请坚信它将为已知的研华产品提供可靠性和易于操作性。客户的满意是我们最关注的。下面是研华客户服务指南。为保证您从我们的服务中获得最大的利益，请谨慎遵循下面的操作指南。

Technical support/ 技术支持

We want you to get the best performance possible from your products. If you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone.

Please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and can be easily solved over the phone.

In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice about application requirements or specific information on the installation and operation of any of our products.

我们衷心希望您购买的产品能够发挥最大的性能。如果您遇到技术问题，我们随时准备为您提供帮助。对于常见问题，您可以在产品文档中找到满意答案。这些答案通常比我们可以在电话上给您提供的答案更为详细。

请先参考本手册。如果仍找不到方案，请搜集和故障有关的所有信息和问题，汇同你手边的资料，给您的经销商打电话。我们的经销商都是接受过专业培训的。通过您提供的产品信息，他们会为您提供所需要的技术支持。事实上，多数问题都是很微小的，通过电话咨询即可解决。

此外，在每个工作日，研华工程师都为客户提供免费的技术支持。关于研华任意一款产品安装和操作方面的应用需求或具体信息，我们都时刻准备着为您提供相关的建议。

Product Warranty (2 years)/ 产品质量保证（两年）

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

从购买之日起，研华为原购买商提供两年的产品质量保证。但对那些未经授权的维修人员维修过的产品并不进行质量保证。研华对于不正确的使用、灾难、错误安装产生的问题有免责权利。

如果研华产品出现故障，在质保期内我们提供免费维修或更换服务。对于出保产品，我们将会酌情收取材料费、人工服务费用。请联系您的销售人员了解详细情况。

如果您认为您购买的产品出现了故障，请遵循以下步骤：

1. 收集您所遇到的问题的信息（例如，CPU 主频、使用的研华产品及其它软件、硬件等）。请注意屏幕上出现的任何不正常信息显示。
2. 打电话给您的供货商，描述故障问题。请借助手册，产品和任何有帮助的信息。
3. 如果您的产品被诊断发生故障，请从您的供货商那里获得 RMA (Return Material Authorization) 序列号。这可以让我们尽快的进行故障产品的回收。
4. 请仔细的包装故障产品，并在包装中附上完整的售后服务卡片和购买日期证明（如销售发票）。我们对无法提供购买日期证明的产品不提供质量保证服务。
5. 把相关的 RMA 序列号写在外包装上，并将其运送给销售人员。

Initial Inspection/ 初始检查

When you open the carton, please make sure that the following materials have been shipped:

- ITA-2000 rack system
- User Manual
- Warranty Card
- Accessory box with 1 x driver/utility CD, 1 X SATA cable 7 pin 180D w/lock, 3 x 10 pin plug-in block and 1 x 18 pin plug-in block

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the ITA-2000 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the ITA-2000, check it for signs of shipping damage. (For examples: box damage, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also, please notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

打开包装时，用户需确认包装中含有本设备以及下面所列各项：

- ITA-2000 上架式系统
- 用户手册
- 质保卡
- 附件盒，含 1 x 驱动 / 实用工具 CD、1 x 带锁 7 针 180DSATA 电缆、3 x 10 针插件以及 1 x 18 针插件

如果其中任何一项缺失或者破损，请立即联系您的销售商或销售代表。

装货前，我们已全面仔细检查过 ITA-2000 产品。因此您购买的产品应当是完好无损且运转正常的。在您打开 ITA-2000 产品的包装时，请检查是否有破损痕迹（例如，包装箱损坏、划痕、凹痕等）。如果产品有破损或者不符合规格，请立即联系我们的服务部门或您的销售商。同时也要通知搬运人员。请保留包装箱及包装材料以备搬运人员检查。检查之后，我们会给您提供维修或更换服务。

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Chapter 1

General Information

概述

This chapter provides general information about the ITA-2000.
本章介绍了 ITA-2000 的基本信息。

1.1 Introduction/ 产品简介

The ITA-2000 is a 2U-high rackmount industrial computer chassis. It meets a variety of application needs for train monitoring. This powerful computing platform can operate under harsh conditions 24 hours a day, 7 days a week.

ITA-2000 是一款 2U 上架式工业机箱。

该产品可满足多种监控应用需求。这款功能强大的计算平台能够 7 天 24 小时连续工作。

1.2 Specifications/ 产品规格

- **CPU:** Intel® ATOM N270 1.6 GHz
 - **System Chipset:** Intel® 945GSE + ICH7M
 - **BIOS:** AWARD® 4 Mbit Flash BIOS
 - **System Memory:** Built-in 1 GB memory expansion one 200-pin SODIMM socket, Support DDR2 400/533/667 MHz up to 2 GB
 - **SSD:** Supports CF Card TYPE I/II
 - **HDD:** Supports industrial extend temperature grade 2.5" SATA HDD or SSD
 - **Watchdog Timer:** Single chip Watchdog 255-level interval timer, setup by software
 - **Digital IO:** 8-ch digital-input and 8-ch digital-output
 - **LED Indicators on Front Panel:** Power, HDD, Fault, COM, DI/DO LAN, CAN
 - **Switch and Buttons on Front Panel:** System reset
 - **Front I/O Interfaces:-** 2 x USB ports
 - **Rear I/O Interfaces:** One PS/2, 2 x RS-232, 8 x RS-232/422/485, 4 x Giga LAN, 2 x CAN, 2 x USB, 8 -ch D I/O
 - **Security Protection:** System reset button is behind the front panel
 - **Weight:** 6 kg (13.21lbs)
 - **Dimensions (W x H x D):** 482 x 88 x 350 mm (19" x 3.46" x 13.8")
-
- CPU: Intel® ATOM N270 1.6 GHz
 - 系统芯片组: Intel® 945GSE + ICH7M
 - BIOS: AWARD® 4 Mbit Flash BIOS
 - 系统内存: 内置 1 GB 内存扩展 200 针 SODIMM 插槽, 支持高达 2 GB DDR2 400/533/667 MHz
 - SSD: 支持 CF 卡 TYPE I/II
 - HDD: 支持工业扩展温度级 2.5" SATA HDD 或 SSD
 - 看门狗定时器: 单芯片看门狗 255 级间隔定时器, 由软件设置
 - 数字量 IO: 8 路数字量输入和 8 路数字量输出
 - 前面板 LED 指示灯: 电源、HDD、故障、COM、DI/DO LAN、CAN
 - 前面板开关和按钮: 系统复位
 - 前部 I/O 接口: 2 x USB
 - 后部 I/O 接口: 1 x PS/2、2 x RS-232、8 x RS-232/422/485、4 x 千兆位 LAN、2 x CAN、2 x USB、8" D I/O
 - 安全保护: 系统重启按钮, 位于前面板后部
 - 重量: 6 kg (13.21 lbs)
 - 尺寸 (W x H x D): 482 x 88 x 350 mm (19" x 3.46" x 13.8")

1.3 Power Supply Options/ 电源选项

ITA-2000 comes with 120 W power supply. It can support AC 100 ~ 240 V / DC 110 ~ 220 V depending on the model required.

ITA-2000 带有 120 W 电源，根据所需型号可提供 AC 100 ~ 240 V / DC 110 ~ 220 V。

Table 1.1: Power supply/ 电源选项

Part No.	1757002341
Output rating 输出功率	120 W max. 最大 120 W
Input Voltage 输入电压	AC 100 ~ 240 V, 40-67 Hz, 2-1 A
Out Voltage 输出电压	+12 V @ 8 A, +5 V @ 14 A, +3.3 V @ 12 A, +5 VSB @ 1.5 A
Power input connector 电源输入接口	3-pole AC power connector 3 极 AC 电源接口

1.4 Environment Specifications/ 环境规格

Table 1.2: Environment specifications/ 环境规格

Environment 环境	Operating 工作
Temperature 温度	10 ~ 50° C
Humidity 湿度	95% @ 40° C, non-condensing (非凝结)
Vibration 振动	Compact Flash: 2 Grms @ 5 ~ 500 Hz, HDD: 1 Grms @ 5 ~ 500 Hz
Shock 冲击	Compact Flash: 50 G, half sine (半正弦), 11 ms HDD: 20G, half sine (半正弦), 11 ms
Safety 安全	UL, CCC, CE and FCC compliant 符合 UL、CCC、CE 和 FCC 标准

1.5 Dimension Diagram/ 产品尺寸

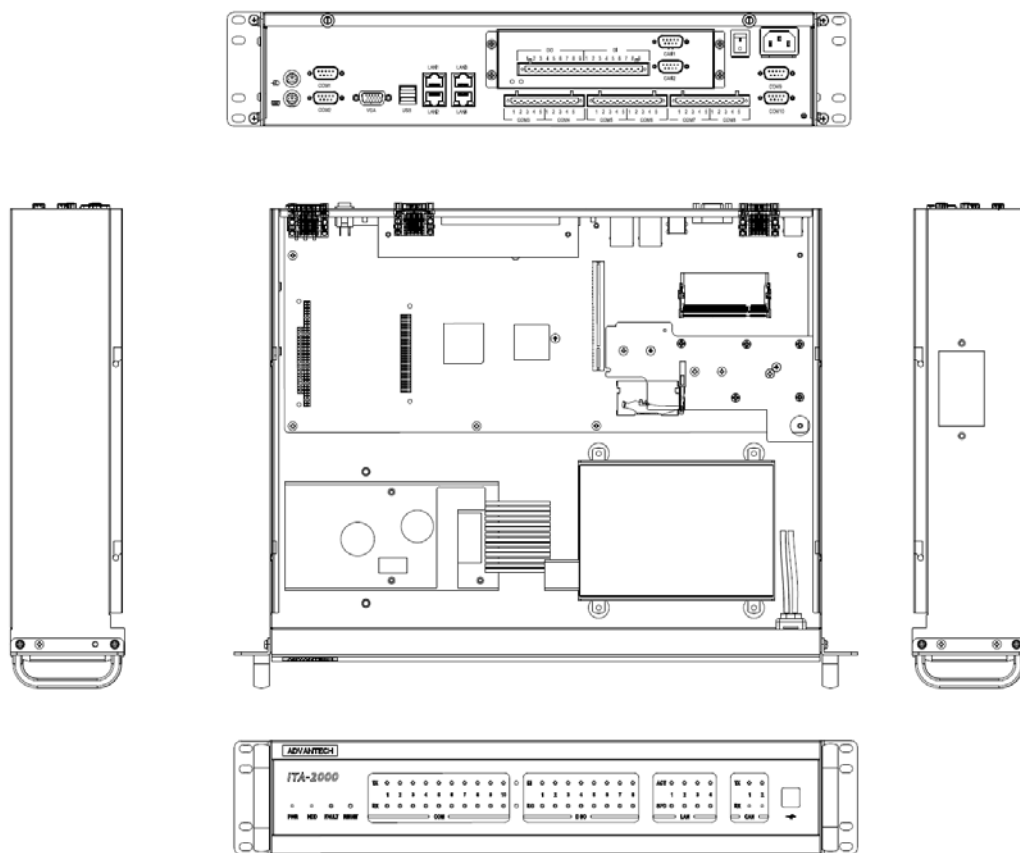


Figure 1.1 Dimension diagram/ 尺寸图

Chapter 2

H/W Installation

硬件安装

This chapter provides H/W Installation about the ITA-2000.

本章介绍了 ITA-2000 的硬件安装信息。

2.1 Introduction/ 简介

The following sections show the internal jumpers setting and the external connectors pin assignment for application.

以下章节介绍了内部跳线设置和外部接口针脚定义。

2.2 System Status Indicators and Switch Button/ 系统状态指示灯和开关按钮

2.2.1 Switch, Button and I/O Interfaces/ 开关、按钮和 I/O 接口

- **System reset button:** Press this button to reboot the system.
- **Dual USB port:** For connecting a wide range of USB devices for data transfer, backup or input.
- **系统复位按钮:** 按下此键重启系统。
- **双 USB 接口:** 用于连接多种进行数据传输、备份或输入的 USB 设备。



Figure 2.1 Front plane/ 前面板

2.2.2 LED Indicators for System Status/ 系统状态 LED 指示灯

LEDs are placed on the left side of the front panel to indicate system health and activity. Refer to below table for an LED definition summary.

前面板左侧的 LED 用于显示系统健康和传输状态。LED 定义简介请参考下表。

Item 项目	LED	Status 状态	Color 色彩	Description 说明
1	PWR	On 亮起	Green 绿色	System power is on 系统电源接通
		Off 熄灭		System power is off 系统电源关闭
2	HDD	On 亮起	Yellow 黄色	Data being received/transmitted on SATA 数据正在通过 SATA 进行接收 / 传输
		Off 熄灭		No data being received/transmitted on SATA 没有数据正在通过 SATA 进行接收 / 传输
3	FAULT	On 亮起	Red 黄色	System temperature too high 系统温度过高
		Off 熄灭		System is safe 系统安全

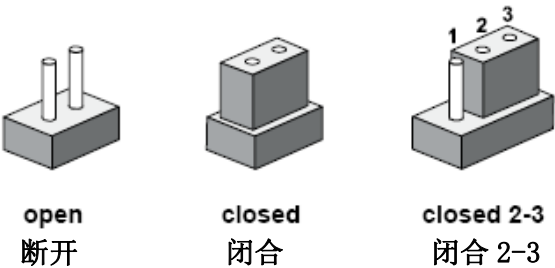
4 COM	COM Tx (Port N)	On 亮起	Green 绿色	Serial port data being transmitted 串行端口数据正在进行传输
	N = 1~10	Off 熄灭		No data being transmitted 没有数据正在进行传输
	COM Rx (Port N)	On 亮起	Yellow 黄色	Serial port data being received 串行数据正在进行接收
	N = 1~10	Off 熄灭		No data being received 没有数据正在进行接收
6 D I/O	DI (Port N)	On 亮起	Green 绿色	No data being received 没有数据正在进行接收
	N = 1~ 8	Flashes 闪烁	Green 绿色	Digital Input port data being received 数字输入数据正在进行接收
	DO (Port N)	On 亮起	Yellow 黄色	No data being transmitted 没有数据正在进行传输
	N = 1~ 8	Flashes 闪烁	Yellow 黄色	Digital output port data being transmitted 数字输出端口数据正在进行传输
5 LAN	ACT (Port N)	On 亮起	Yellow 黄色	Ethernet data being received/transmitted 以太网数据正在进行接收 / 传输
	N = 1~ 4	Off 熄灭		No data being received/transmitted 没有数据正在接收 / 传输
	LINK (Port N)	On 亮起	Green 绿色	10/100/1000Mbps Network links 10/100/1000 Mbps 网络连接
	N = 1~ 4	Off 熄灭		Invalid 10/100 Mbps Network link 无效 0/100 Mbps 网络连接
7 CAN	CAN Tx (Port N)	On 亮起	Green 绿色	CAN bus data being transmitted CAN 总线数据正在进行传输
	N = 1~ 2	Off 熄灭		No data being transmitted 没有数据正在进行传输
	CAN Rx (Port N)	On 亮起	Yellow 黄色	CAN bus data being received CAN 总线数据正在进行接收
	N = 1~ 2	Off 熄灭		No data being received 没有数据正在进行接收

2.3 Jumpers/ 跳线

2.3.1 Jumper Description/ 跳线说明

You may configure the ITA-2000 to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To close a jumper, you remove the clip. Sometime a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.

用户可以根据应用需要通过设置跳线进行 ITA-2000 配置。板卡可以通过设置跳线进行配置。跳线是用来连通电路的金属桥。它包括 2 个金属针脚和一个跳线帽（里面是金属夹片，外部是起保护作用的塑料套）。跳线帽可套住针脚将其连成通路。移走跳线帽则会断开线路。有时，一个跳线具有 3 个针脚，分别为针 1、2、3。这种情况下，用户可以任意选择连接针脚 1、2 或者针脚 2、3。



The jumpers setting are schematically depicted in this manual as follows.

设备的跳线设置如下图所示：



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

进行跳线设置时，使用针鼻钳可能会有所帮助。若用户对应用的最佳硬件配置产生任何疑问，请在进行更改前联系当地的分销商或销售代表。一般情况下，多数连接仅需要一根标准电缆。

2.3.2 Jumper and Connector Location/ 跳线和接口位置

Clear COMS/ 清除 COMS

Table 2.1: JCMOS1

Setting 设置	Function 功能
(1-2)	NORMAL (Default) 正常 (默认)
(2-3)	Clear CMOS 清除 CMOS

COM2 Mode Setting/COM2 模式设置

Table 2.2: JSETCOM2

Setting 设置	Function 功能
Close (5-6, 7-9, 8-10, 13-15, 14-16) 闭合 (5-6、7-9、8-10、13-15、14-16)	RS-232 (Default) RS-232 (默认)
Close (3-4, 9-11, 10-12, 15-17, 16-18) 闭合 (3-4、9-11、10-12、15-17、16-18)	RS-422
Close (1-2, 9-11, 10-12, 15-17, 16-18) 闭合 (1-2、9-11、10-12、15-17、16-18)	RS-485

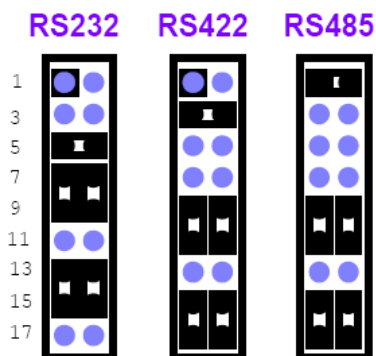


Figure 2.2 COM2 setting/COM2 设置

COM3 ~ COM10 Mode Setting/COM3 ~ COM10 模式设置

Table 2.3: JSETCOM3~10

Setting 设置	Function 功能
Close (1-2, 3-4, 5-6, 7-8, 9-10) 闭合 (1-2、3-4、5-6、7-8、9-10)	RS-232 (Default) RS-232 (默认)
Close (11-12, 13-14, 15-16, 17-18, 19-20) 闭合 (11-12、13-14、15-16、17-18、19-20)	RS-422/RS-485

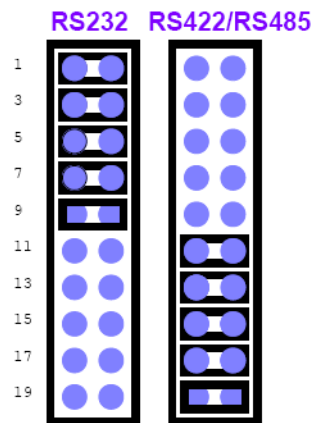


Figure 2.3 COM3 ~ COM10 setting/COM3 ~ COM10 设置

COM3~COM10 RS-485 Terminator/COM3 ~ COM10 RS-485 终端电阻

Table 2.4: JCOMT3~10

Setting 设置	Function 功能
Close (1-3) 闭合 (1-3)	Data - set up Terminator Data- 设置终端电阻
Close (2-4) 闭合 (2-4)	Data + set up Terminator Data+ 设置终端电阻
Open (1-3) 断开 (1-3)	Data - Non Terminator Data- 无终端电阻
Open (2-4) 断开 (2-4)	Data + Non Terminator Data+ 无终端电阻

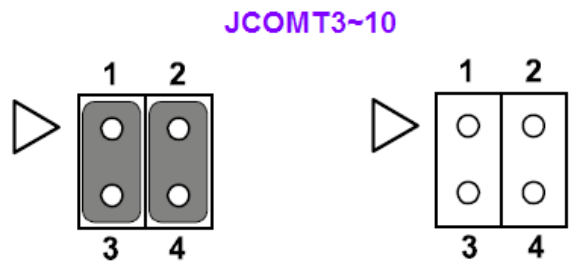


Figure 2.4 JCOMT3 ~ 10 setting/JCOMT3 ~ COM10 设置

2.4 Connectors of Rear I/O/ 后部 I/O 接口

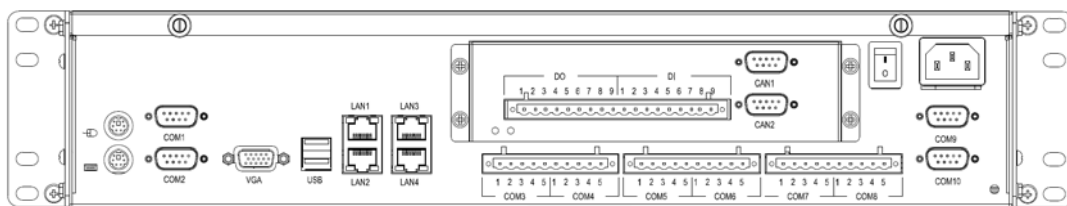


Figure 2.5 ITA-2000 I/O Connectors drawing/ITA-2000 I/O 接口图

2.4.1 COM Connector/COM 端口

ITA-2000 provides four D-sub 9-pin and three phoenix 10-pin connectors, among which eight COM ports support RS-232/422/485 with isolation.

ITA-2000 提供了 4 个 D-sub 9 针和 3 个 phoenix 10 针接口，其中 8 个 COM 端口支持带隔离 RS-232/422/485。

2.4.1.1 COM 1/2/9/10 of D-Sub Connector/D-Sub COM 1/2/9/10 端口

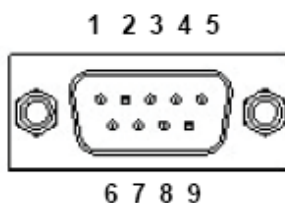


Figure 2.6 D-sub COM Connector/D-sub COM 端口

Table 2.5: D-sub Connector Pin Assignments/D-sub 接口针脚定义

	RS-232	RS-422	RS-485
Pin 针脚	Signal name 信号名称	Signal name 信号名称	Signal name 信号名称
1	DCD	Tx-	Data-
2	RxD	Tx+	Data+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.4.1.2 COM 3/4/5/6/7/8 of Phoenix Connector/Phoenix COM 3/4/5/6/7/8 端口

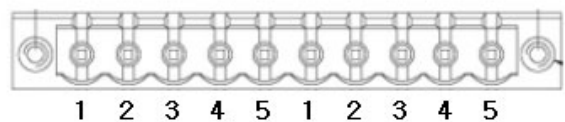


Figure 2.7 Phoenix COM connector/Phoenix COM 端口

Table 2.6: Phoenix Connector Pin Assignments/Phoenix 接口针脚定义			
	RS-232	RS-422	RS-485
Pin 针脚	Signal name 信号名称	Signal name 信号名称	Signal name 信号名称
1	Rx	Tx+	Data+
2	Tx	Tx-	Data-
3	RTS	Rx+	
4	CTS	Rx-	
5	GND	GND	GND
1	Rx	Tx+	Data+
2	Tx	Tx-	Data-
3	RTS	Rx+	
4	CTS	Rx-	
5	GND	GND	GND

2.4.2 VGA Connector/VGA 接口

ITA-2000 offers a standard VGA Interface connector by D-sub 15-pin female connector.

ITA-2000 提供 1 个标准的 D-sub 15 针母型 VGA 接口。

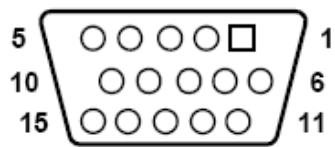


Figure 2.8 VGA D-sub Connector/VGA D-sub 接口

Table 2.7: VGA Connector Pin Assignments/VGA 接口针脚定义			
Pin 针脚	Signal name 信号名称	Signal name 信号名称	Signal name 信号名称
1	RED	9	CRT_VCCIN
2	VGA_G	10	GND
3	VGA_B	11	N/C
4	N/C	12	V_SDAT
5	GND	13	H_SDAT
6	GND	14	V_SYNC
7	GND	15	V_SCLK

2.4.3 USB Connector/USB 接口

ITA-2000 provides four USB interface connectors, which give complete Plug & Play and hot swapping for up 127 external devices. The USB interface complies with USB UHCI, Rev. 2.0 compliant. The USB interface can be disabled in the system BIOS setup. Please refer to table 2.8 for its pin assignments.

ITA-2000 提供 4 个 USB 接口，可为多达 127 个外部设备提供完全的即插即用和热插拔功能。USB 接口符合 USB UHCI, Rev. 2.0 标准，可通过系统 BIOS 设置禁用。其针脚定义信息请参考表 2.8。



Figure 2.9 USB connector/USB 接口

Table 2.8: USB Connector Pin Assignments/USB 接口针脚定义

Pin 针脚	Signal name 信号名称	Signal name 信号名称	Signal name 信号名称
1	VCC	2	USB_Data-
3	USB_Data+	4	GND

2.4.4 Ethernet Connector (LAN1 ~ LAN4)/ 以太网接口 (LAN1 ~ LAN4)

ITA-2000 is equipped with four Intel 82574 Ethernet controllers that are fully compliant with IEEE 802.3u 10/100/1000Mbps standard.

ITA-2000 带有 4 个 Intel 82574 以太网控制器，完全符合 IEEE 802.3u 10/100/1000 Mbps 标准。

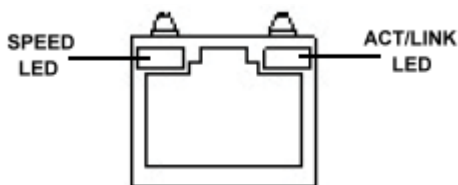


Figure 2.10 Ethernet connector/ 以太网接口

Table 2.9: RJ-45 LEDs

ACT / LINK LED 活跃 / 连接 LED		SPEED LED 速率 LED	
Status 状态	Description 说明	Status 状态	Description 说明
OFF 熄灭	No link 无连接	OFF 熄灭	10 Mbps connection 10 Mbps 连接
Green 绿色	Green 绿色	ORANGE 橙色	100 Mbps connection 100 Gbps 连接

Blinking 闪烁	Data activity 数据传输	GREEN 绿色	1 Gbps connection 1 Gbps 连接
----------------	-----------------------	-------------	--------------------------------

Table 2.10: RJ-45 Connector Pin Assignment/RJ-45 接口针脚定义

Pin 针脚	10/100/1000Base-T Signal Name 10/100/1000Base-T 信号名称
1	TX+
2	TX-
3	RX+
4	MDI2+
5	MDI2-
6	RX-
7	MDI3+
8	MDI3-

2.4.5 DIO Connector/DIO 接口

ITA-2000 provides one phoenix 18-pin male connectors, which offers Digital Input/Output communication interface. If client want to use DIO, please find the Pin assignment as following.

ITA-2000 提供 1 个 phoenix 18 针母型数字输入 / 输出通信接口。用户使用 DIO 时，请参考以下针脚定义。

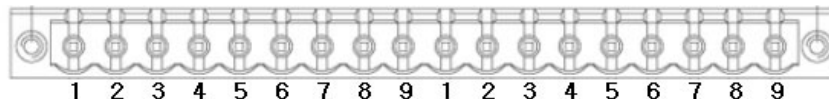


Figure 2.11 DIO Connector/DIO 接口

Table 2.11: DIO Connector Pin Assignments/DIO 接口针脚定义

Pin 针脚	Signal name 信号名称	LED Indicator LED 指示灯
1	GND	
2	DO_0	DO_1
3	DO_1	DO_2
4	DO_2	DO_3
5	DO_3	DO_4
6	DO_4	DO_5
7	DO_5	DO_6
8	DO_6	DO_7
9	DO_7	DO_8
1	GND	
2	DI_0	DI_1
3	DI_1	DI_2
4	DI_2	DI_3
5	DI_3	DI_4

6	DI_4	DI_5
7	DI_5	DI_6
8	DI_6	DI_7
9	DI_7	DI_8

2.4.6 CAN Connector/CAN 接口

ITA-2000 provides CAN Bus Interface by two D-sub 9-pin connector.

ITA-2000 提供 2 个 D-sub 9 针 CAN 总线接口。

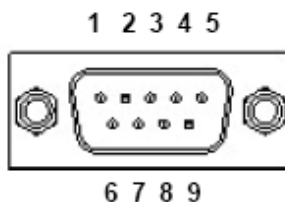


Figure 2.12 D-sub COM Connector/D-sub COM 接口

Table 2.12: CAN Connector Pin Assignments/CAN 接口针脚定义

Pin 针脚	Signal name 信号名称
1	NC
2	CAN_L
3	GND
4	NC
5	NC
6	NC
7	CAN_H
8	NC
9	NC

2.4.7 Power ON/OFF Button / Power Input Connector/ 电源开关按钮/ 电源输入接口

ITA-2000 comes with a Power ON/OFF button and AC inlet, its support AT function with that carries 110 V ~ 240 VAC power input.

ITA-2000 带有电源开关按钮和 AC 插座，支持 AT 功能，具有 110 V ~ 240 VAC 电源输入功能。

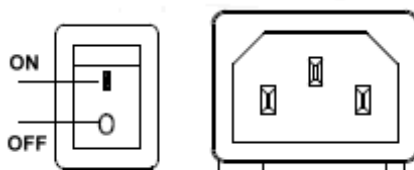


Figure 2.13 Power button and AC inlet/ 电源按钮和 AC 插座

Chapter 3

BIOS Operation

BIOS 操作

This chapter describes how to set BIOS configuration data.

本章介绍了如何进行 BIOS 数据设置。

3.1 Introduction/ 简介

AwardBIOS 6.0 is a full-featured BIOS provided by Advantech to deliver superior performance, compatibility, and functionality to industrial PCs and embedded boards. Its many options and extensions let you customize your products to a wide range of designs and target markets.

The modular, adaptable AwardBIOS 6.0 supports the broadest range of third-party peripherals and all popular chipsets, plus Intel, AMD, nVidia, VIA, and compatible CPUs from 386 through Pentium, AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPUs.

You can use Advantech's utilities to select and install features that suit your needs and your customers' needs.

研华为工业计算机和嵌入式板卡制造商提供了具有高级兼容性和功能性的 AwardBIOS 6.0 程序，该程序带有多项选项以及扩展选项供用户根据设计和目标市场定制化产品。模块化、可调整的 AwardBIOS 6.0 支持广泛的第三方外围设备和所有通用的芯片组，以及 Intel、AMD、nVidia、VIA、Pentium® 和 AMD Geode® 386 CPU、K7 和 K8（包括多种处理器平台）、VIA Eden C3 和 C7 CPU。用户可使用研华实用工具选择和安装适合自己设计需求的特性。

3.2 BIOS Setup/BIOS 设置

ITA-2000 system has AwardBIOS 6.0 built-in, which includes a CMOS SETUP utility that allows users to configure settings as required or to activate certain system features. The CMOS SETUP saves configuration settings in the CMOS RAM of the motherboard. When the system power is turned off, the onboard battery supplies the necessary power to the CMOS RAM so that settings are retained. To access the CMOS SETUP screen, press the button during the power-on BIOS POST (Power-On Self Test).

ITA-2000 系统内置含 CMOS SETUP 实用工具的 AwardBIOS 6.0，允许用户配置所需设置或激活某些系统特性。CMOS SETUP 将配置保存在主板 CMOS RAM 中。断电时，母板的电池可供给 CMOS RAM 所需的电源。开机后，在 BIOS POST（开机自检时）时按下 键将进入 CMOS SETUP 界面。

Table 3.1: Control Keys/ 控制键

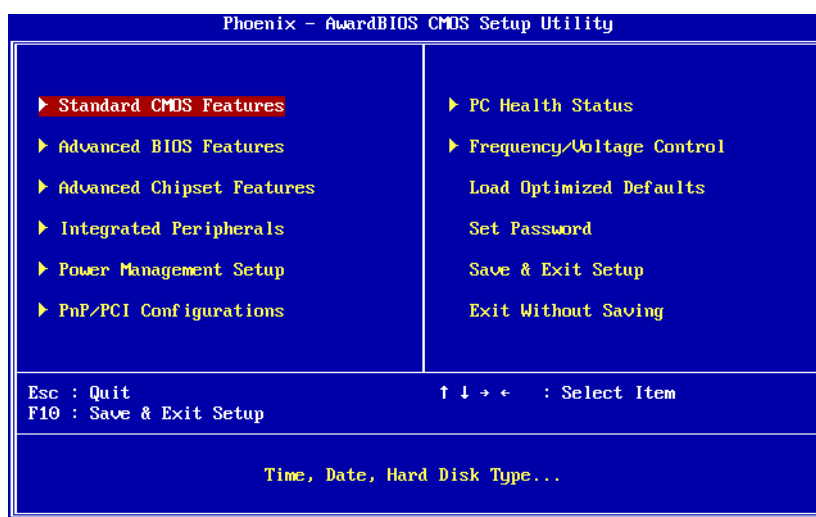
< ↑ >< ↓ >< ← >< → >	Move to select item 移动到所选项
<Enter>	Select Item 选择项目
<Esc>	Main Menu - Quit and not save changes into CMOS Sub Menu - Exit current page and return to Main Menu 主菜单 - 退出不保存 CMOS 更改 子菜单 - 退出当前页面并返回到主菜单
<Page Up/+>	Increase the numeric value or make changes 增加数值或进行更改
<Page Down/->	Decrease the numeric value or make changes 减小数值或进行更改
<F1>	General help, for Setup Sub Menu 一般帮助，用于设置子菜单

<F2>	Item Help 选项帮助
<F5>	Load Previous Values 加载原来数值
<F7>	Load Setup Default 加载默认设置
<F10>	Save all CMOS changes 保存所有 CMOS 更改

3.2.1 Main Menu/ 主菜单

Press the key during startup to enter the BIOS CMOS Setup Utility; the Main Menu will appear on the screen. Use arrow keys to highlight the desired item, and press <Enter> to accept, or enter the sub-menu.

按下 键便进入 AwardBIOS CMOS 设置界面，将出现主界面。通过方向键选择选项然后按下 <Enter> 确定或进入子菜单。

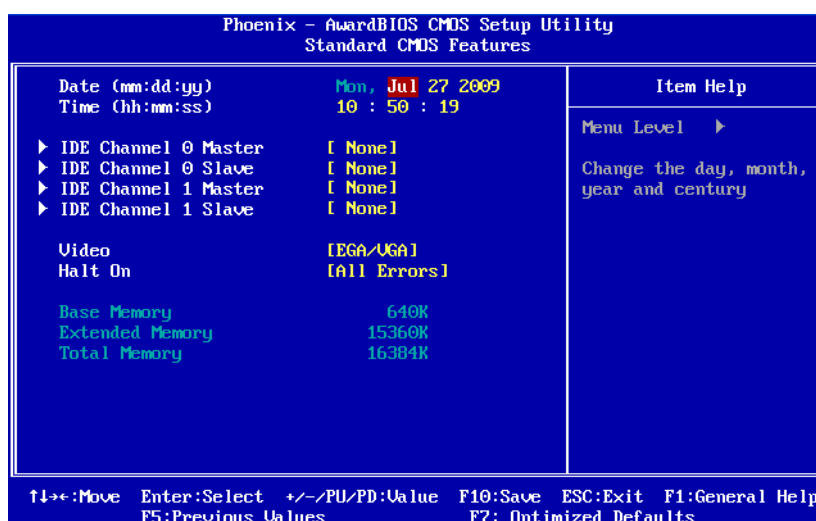


- **Standard CMOS Features**
This setup page includes all the items in standard compatible BIOS.
- **Advanced BIOS Features**
This setup page includes all the items of Award BIOS enhanced features.
- **Advanced Chipset Features**
This setup page includes all the items of Chipset configuration features.
- **Integrated Peripherals**
This setup page includes all onboard peripheral devices.
- **Power Management Setup**
This setup page includes all the items of Power Management features.
- **PnP/PCI Configurations**
This setup page includes PnP OS and PCI device configuration.
- **PC Health Status**
This setup page includes the system auto detect CPU and system temperature, voltage, fan speed.
- **Frequency/Voltage Control**
This setup page includes CPU host clock control, frequency ratio and voltage.

- **Load Optimized Defaults**
This selection loads optimized values for best system performance configuration.
- **Set Password**
Establish, change or disable password.
- **Save & Exit Setup**
Save CMOS value settings to CMOS and exit BIOS setup.
- **Exit Without Saving**
Abandon all CMOS value changes and exit BIOS setup.

- **标准 CMOS 特性**
该设置包含标准可兼容 CMOS 中所包含的所有选项。
- **高级 BIOS 特性**
该设置包含 Award BIOS 高级特性的所有选项。
- **高级芯片组特性**
该设置包含芯片组配置特性的所有选项。
- **集成外围设备**
该设置包含所有板载外围设备。
- **电源管理设置**
该设置包含电源管理特性的所有选项。
- **PnP/PCI 配置**
该设置包含 PnP OS 和 PCI 设备配置的所有选项。
- **PC 健康状况**
该设置包含系统自动检测 CPU 以及系统温度、电压和风扇速度。
- **频率 / 电压控制**
该设置包含 CPU 主时钟控制、频率和电压。
- **加载最优化默认设置**
该设置包含加载系统最优化数值以获得最优化配置。
- **设置密码**
设置、更改或禁用密码。
- **保存并退出设置**
将 CMOS 数值设置保存在 CMOS 然后退出 BIOS 设置。
- **不保存便退出设置**
取消所有 CMOS 数值更改并退出 BIOS 设置。

3.2.2 Standard CMOS Features/ 标准 CMOS 特性



■ Date

The date format is <weekday>, <month>, <day>, <year>.

Weekday	From Sun to Sat, determined and displayed by BIOS only
Month	From Jan. to Dec.
Day	From 1 to 31
Year	From 1999 through 2099

■ Time

The time format is <hour> <minute> <second>, based on 24-hour time.

■ IDE Channel 0 Master

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

■ IDE Channel 0 Slave

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

■ IDE Channel 1 Master

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

■ IDE Channel 1 Slave

IDE HDD Auto-Detection Press "Enter" for automatic device detection.

■ Video [EGA/VGA]

Select EGA or VGA display.

■ Halt on [All Errors]

The item determines whether the computer will stop if an error is detected during power up.

No Errors	The system boot will not stop for any error.
All Errors	Whenever the BIOS detects a non-fatal error the system will be stopped.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors. (Default value)

■ Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

■ **Extended Memory**

The BIOS POST will determine the amount of extended memory (above 1 MB in CPU's memory address map) installed in the system.

■ **Total Memory**

This item displays the total system memory size.

■ **日期**

日期的格式为 < 星期 > < 月 > < 日 > < 年 >。 .

星期	星期日 ~ 星期六，仅通过 BIOS 确定和显示
月	1 ~ 12
日	1 ~ 31
年	1999 ~ 2099

■ **时间**

时间的格式为 < 时 > < 分 > < 秒 >，24 小时制。

■ **IDE 通道 0 主**

IDE HDD 自动检测：按 “Enter” 键选择此项执行设备自动检测。

■ **IDE 通道 0 次**

IDE HDD 自动检测：按 “Enter” 键选择此项执行设备自动检测。

■ **IDE 通道 1 主**

IDE HDD 自动检测：按 “Enter” 键选择此项执行设备自动检测。

■ **IDE 通道 1 次**

IDE HDD 自动检测：按 “Enter” 键选择此项执行设备自动检测。

■ **视频 [EGA/VGA]**

选择 EGA 或 VGA 视频。

■ **停止引导 [All Errors]**

此项用于决定在系统引导过程中遇到错误时，系统是否停止引导。

No Errors	遇到任何错误系统都不会停止运行。
All Errors	BIOS 检测到非致命错误时，系统将停止运行。
All, But Keyboard	遇到键盘错误时系统将停止运行；其它错误时不会停止运行（默认设置）。

■ **基本内存**

BIOS POST 将决定系统的基本（常规）内存。

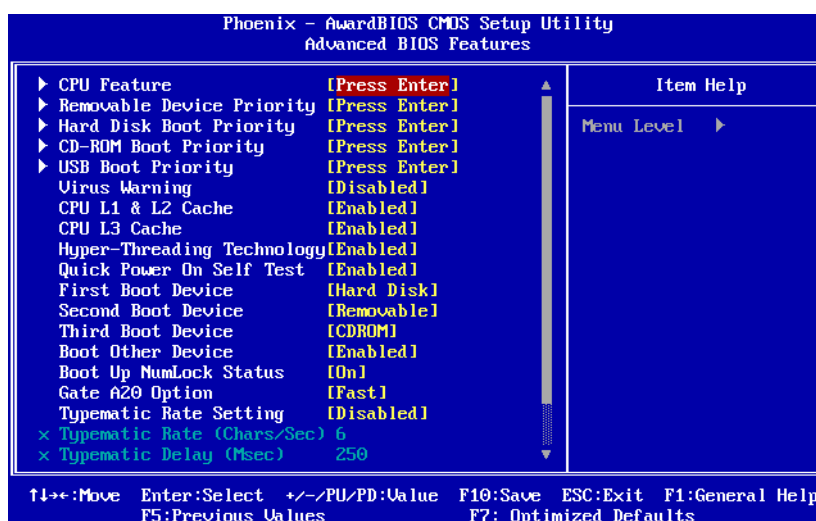
■ **扩展内存**

BIOS POST 将决定系统的扩展内存（CPU 内存地址映射中大于 1 MB）。

■ **总内存**

此项显示了总的系统内存大小。

3.2.3 Advanced BIOS Features/ 高级 BIOS 特性



- **CPU Feature**
This item allows user to adjust CPU features.
- **Hard Disk Boot Priority**
This item allows user to select boot sequence for system device HDD, USB-HDD, SCSI, RAID.
- **Virus Warning [Disabled]**
Enables or disables the virus warning.
- **CPU L1 & L2 Cache [Enabled]**
This item allows user to enable CPU L1 and L2 cache.
- **CPU L3 Cache [Enabled]**
This item allows user to enable CPU L3 cache.
- **Hyper-Threading Technology [Enabled]**
While using a CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper-Threading Technology in an OS which supports Hyper-Threading Technology or select "Disabled" for other OSs which do not support Hyper-Threading technology.
- **Quick Power On Self Test [Enabled]**
This field speeds up the Power-On Self Test (POST) routine by skipping retest-ing a second, third and forth time. Setup setting default is enabled.
- **First / Second / Third / Other Boot Drive**
The BIOS attempts to load the operating system from the devices in the sequence selected in these items. The settings are Hard Disk, CDROM, USB-FDD, USB-ZIP, USB-CDROM, LAN, and Disabled.
- **Boot Up NumLock Status [On]**
The default value is On.
On (default) Keypad is numeric keys.
Off Keypad is arrow keys.
- **Gate A20 Option [Fast]**
This item enables users to switch A20 control by port 92 or not.
- **Typematic Rate Setting [Disabled]**
This item enables users to set the two typematic controls items.
 - **Typematic Rate (Chars/Sec)**

This item controls the speed at which the system registers auto-repeated key-strokes. The eight settings are 6, 8, 10, 12, 15, 20, 24 and 30.

– **Typematic Delay (Msec)**

This item sets the keypress time delay before autorepeat begins.

Four delay rate options are 250, 500, 750 and 1000.

■ **Security Option [Setup]**

System	System will not boot and refuses access to Setup page if the correct password is not entered at the prompt.
Setup	System will boot, but access to Setup requires password (default value).

■ **MPS Version Control For OS [1.4]**

An MP Platform interface standard that extends the performance of the existing PC/AT platform beyond the traditional single processor limit, while maintaining 100% PC/AT binary compatibility.

■ **CPU 特性**

此项允许用户调整 CPU 特性。

■ **硬盘启动顺序**

此项允许用户选择系统设备 HDD、USB-HDD、SCSI 和 RAID 的启动顺序。

■ **病毒警告 [Disabled]**

此项允许用户启用或禁用病毒警告特性。

■ **CPU L1 & L2 缓存 [Enabled]**

此项允许用户启用 CPU L1 和 L2 缓存。

■ **CPU L3 缓存 [Enabled]**

此项允许用户启用 CPU L3 缓存。

■ **超线程技术 [Enabled]**

使用具有超线程技术的 CPU 时，当 OS 支持超线程技术时请选择 “Enabled” 启用该功能；当 OS 不支持超线程技术时请选择 “Disabled” 禁用该功能。

■ **快速开机自我检测 [Enabled]**

此项允许用户跳过第二次、第三次和第四次重检测进而加快开机速度。设置默认值是启用。

■ **第一 / 第二 / 第三 / 其他启动设备**

BIOS 将按照下列顺序从设备中加载 OS。选项为 “Hard Disk”、“CDROM”、“USB-FDD”、“USB-ZIP”、“USB-CDROM”、“LAN” 和 “Disabled”。

■ **启动时数字锁定键状态 [On]**

默认为 “On”。

On（默认） 软件盘为数字键。

Off 软键盘为方向键。

■ **Gate A20 选择 [Fast]**

此项允许用户通过端口 92 切换进行 A20 控制。

■ **键入速率设定 [Disabled]**

此项允许用户设置两种键入控制选项。

– **键入速率（字 / 秒）**

键入速率是指由键盘控制器决定的键击重复速率。8 种设置分别为：6、8、10、12、15、20、24 和 30。

– **字元输入延迟 (msec)**

字元输入延迟是指当用户按住某个键时，显示 2 个连续字符所需的时间间隔。

4 种延迟选项为 250、500、750 和 1000。

■ 安全性选择 [Setup]

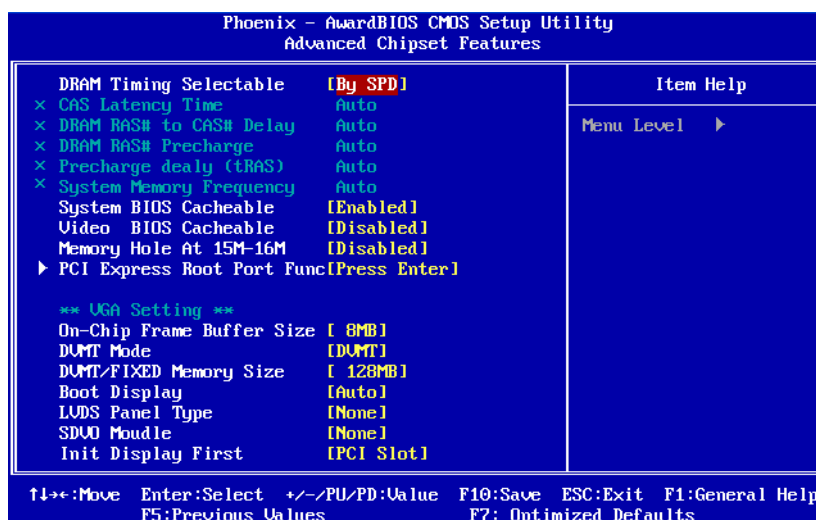
System 若看到提示信息后没有键入正确的密码，则不能启动系统且不能访问系统设置。

Setup 若看到提示信息后没有键入正确的密码，则可以启动系统但不能访问系统设置。

■ OS MPS 版本控制 [1.4]

一种用于在传统单处理器限制之外扩展当前 PC/AT 平台性能的 MP 平台接口标准，同时保留 100% PC/AT 二进制兼容性。

3.2.4 Advanced Chipset Features/ 高级芯片组特性



■ DRAM Timing Selectable [By SPD]

This item enables users to set the optimal timings for items 2 through 5; system default setting “By SPD” follows the SPD information and ensures the system runs stably with optimal performance.

■ System BIOS Cacheable [Enabled]

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: Enabled, Disabled.

■ Video BIOS Cacheable [Disabled]

Selecting Enabled allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result. Setting options: Disabled, Enabled.

■ Memory Hole At 15M-16M [Disabled]

When enabled, you can reserve an area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. Refer to the user documentation of the peripheral you are installing for more information. Options: Disabled (default), Enabled

■ PCI Express Root port Function

This item allows the user to adjust PCIe port on, off or auto.

■ On-Chip Frame Buffer Size[8 MB]

- This item allows the user to adjust the on-chip frame buffer size 8 MB or 1 MB.
- **DVMT Mode [DVMT]**

This item allows the user to adjust Intel's Dynamic Video Memory Technology (DVMT). BIOS provides three options: DVMT, FIXED, and Both.
 - **DVMT/FIXED Memory Size [128MB]**

This item allows the user to adjust DVMT/FIXED graphics memory size.
 - **Boot Display [Auto]**

This item allows the user to decide that display mode.
 - **LVDS Panel Type**
 - **SDVO Module**

This item allows the user to decide display resolution.
 - **Init Display First [PCI Slot]**

This item is the setting for start up video output: either from PCI Express or Onboard device.
-
- **DRAM 时序选择 [By SPD]**

此项可允许用户设置选项 2-5 的最优化时序，系统默认设置 “By SPD” 依据 SPD 信息，从而保证了系统以最佳性能稳定运行。
 - **系统 BIOS 缓冲 [Enabled]**

启用此项，可使系统 BIOS ROM 缓冲达到 F000h-FFFFh，能够提供更优越的系统性能。但是任何程序向此内存区进行写操作时，都可能导致系统错误。选项为 “Enabled” 或 “Disabled”。
 - **视频 BIOS 缓冲 [Disabled]**

启用此项将允许视频 BIOS 缓存，能够提供更优越的系统性能。但是任何程序向此内存区进行写操作时，都可能导致系统错误。选项为 “Enabled” 或 “Disabled”。
 - **15 M - 16 M 之间的内存保留区**

启用此项可为 ISA 适配器 ROM 预留 15 MB ~ 16 MB 的内存空间。这部分预留的空间将不能用于缓存。更多信息请参考外围设备安装用户指导。选项为 “Disabled”（默认）或 “Enabled”。
 - **PCI Empress 启动端口功能**

此项允许用户将 PCIE 端口设置为 “On”、“Off” 或 “Auto”。
 - **板载帧缓存大小 [8 MB]**

板载帧缓冲大小可设置为 1 MB 或 8 MB。
 - **DVMT 模式 [DVMT]**

此项用于选择视频内存模式。选项为 “Fixed”、“DVMT” 和 “BOTH”。
 - **DVMT/FIXED 内存大小**

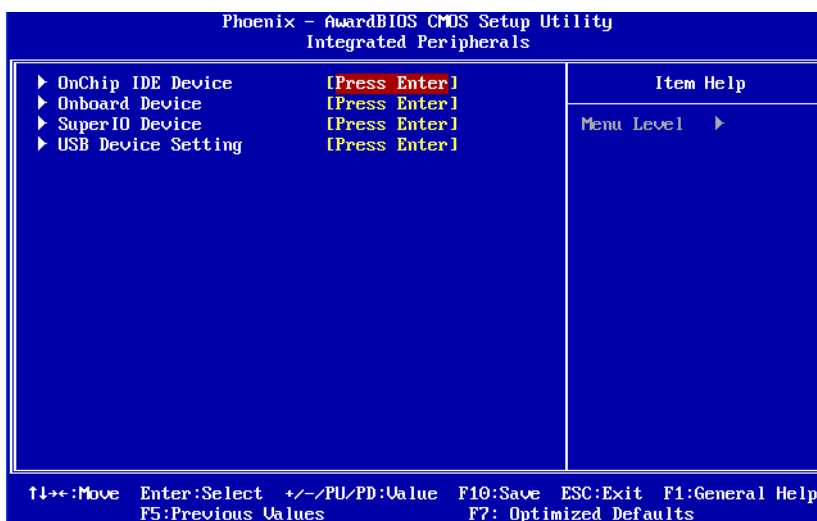
此项允许用户调节分配给显存的 DVMT/ 系统内存大小。
 - **启动显示 [Auto]**

此项允许用户确定启动显示模式。
 - **LVDS 面板类型**
 - **SDVO 模块**

此项允许用户确定显示屏分辨率。
 - **显卡优先设置 [PCI Slot]**

此项为视频输出启动设置：PCI Express 或 Onboard device（板载设备）。

3.2.5 Integrated Peripherals/ 集成外围设备



Note! This "Integrated Peripherals" page controls the configuration of the board's chipset, including IDE, ATA, SATA, USB, AC97, MC97 and Super IO and Sensor devices. This page is chipset dependent; the screen capture above is illustrative, but screens do differ depending on chipset features.



注! 该“集成外围设备”界面控制板载芯片组的配置，包括 IDE、ATA、SATA、USB、AC97、MC97 以及高级 IO 和传感器设备。该界面取决于芯片组；以上界面仅作参考，若芯片组特性不同界面也会不同。

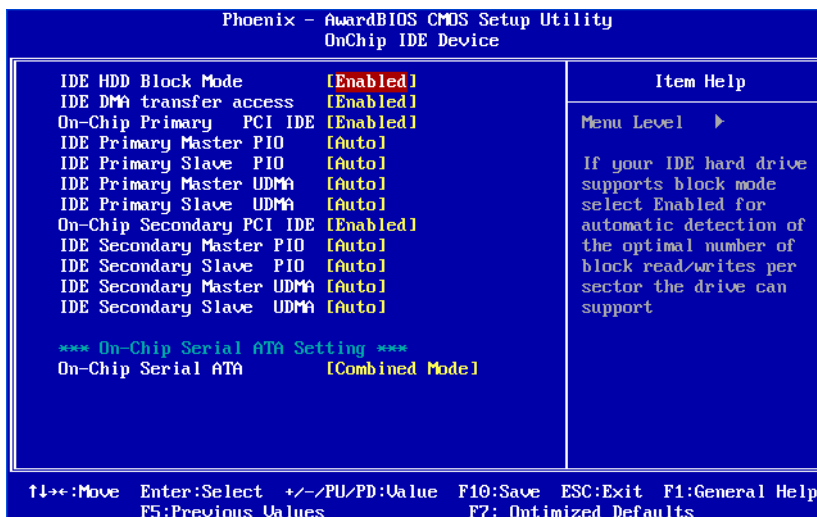


■ OnChip IDE Device

This item enables users to set the OnChip IDE device status, including some of new chipsets also support SATA devices (Serial-ATA).

■ 板载 IDE 设备

此项目允许用户设置 OnChip IDE 设备状态，包括一些也支持 SATA 设备（串行 ATA）的芯片组。

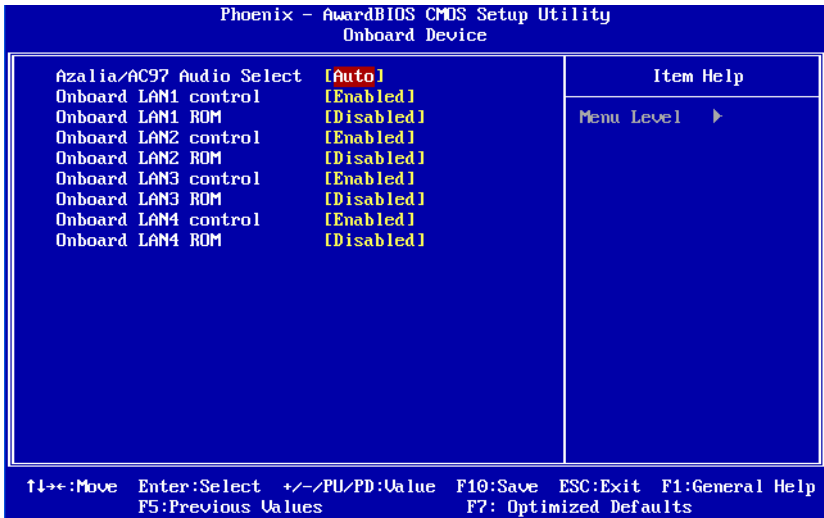


■ **Onboard Device**

This item enables users to set the Onboard device status, including enabling AC97, and LAN devices.

■ **板载设备**

此项允许用户设置板载设备状态，包括启用 AC97 和 LAN 设备。

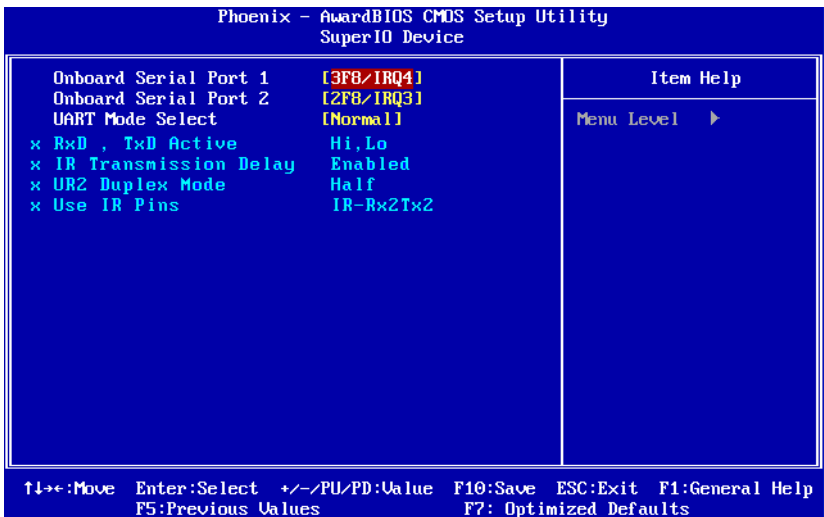


■ **Super IO Device**

This item enables users to set the Super IO device status, including enabling of COM, and LPT.

■ **高级 IO 设备**

此项允许用户设置高级 IO 设备状态，包括启用 COM 和 LPT。



– **Onboard Serial port 1 [3F8 / IRQ4]**

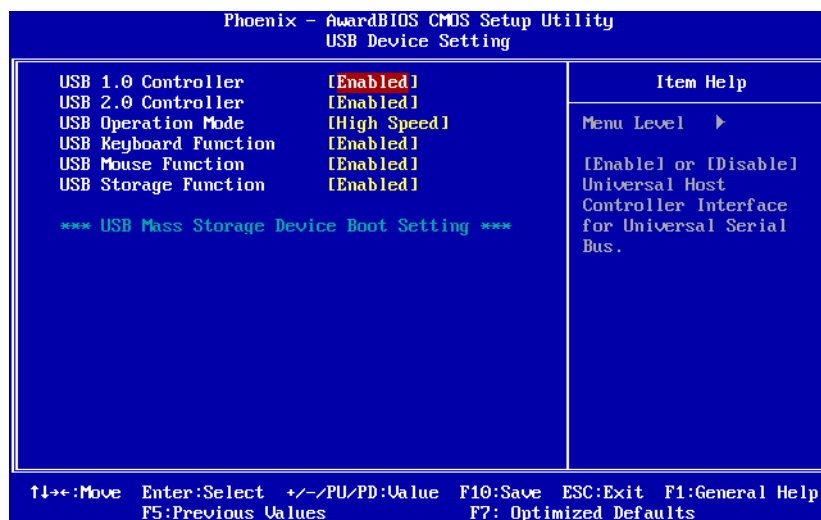
This item allows user to adjust serial port 1 of address and IRQ.

– **Onboard Serial port 2 [2F8/ IRQ3]**

This item allows user to adjust serial port 2 of address and IRQ.

- 板载串行端口 1 [3F8 / IRQ4]
该项允许用户调节串行端口 1 的地址和中断。
- 板载串行端口 2 [2F8 / IRQ3]
该项允许用户调节串行端口 1 的地址和中断。

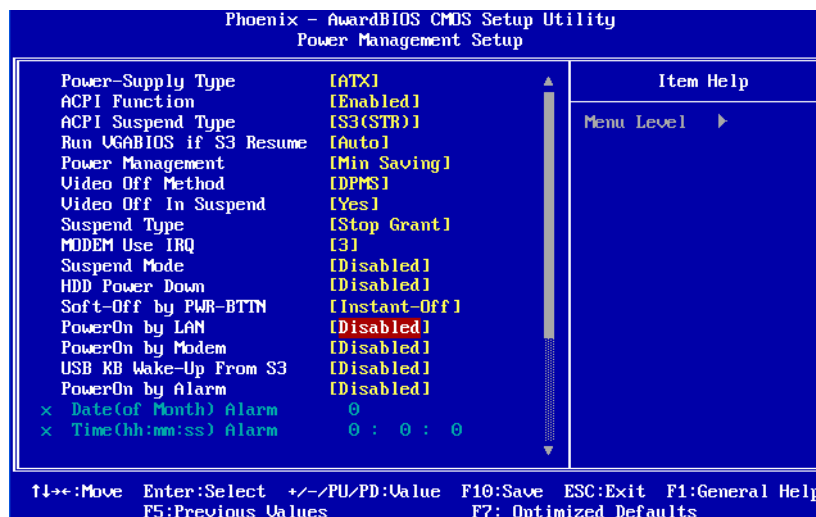
■ USB Device Setting/USB 设备设置



- **USB 1.0 Controller**
Select Enabled. if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices are "Enabled" and "Disabled".
- **USB 2.0 Controller**
This entry is used to disable/enable the USB 2.0 controller only. The BIOS itself may or may not have high-speed USB support. If the BIOS has high speed USB support built in, the support will automatically turn on when a high speed device is attached. The choices are "Enabled" or "Disabled".
- **USB Operation Mode**
Set the USB 2.0 controller to Hi Speed (480 Mbps) or Full Speed (12 Mbps).
- **USB Keyboard / Mouse Function**
Select .Enabled. if you plan to use a USB keyboard/Mouse. The choices are "Enabled" and "Disabled".
- **USB Storage Function**
Select "Enabled" if you plan to use an external USB storage device to boot system under DOS mode. The choices are "Enabled" and "Disabled".
- **USB1.0 控制器**
若系统中含有通用串行总线（USB）控制器且用户有 USB 外围设备，请选择 Enabled。选项为“Enabled”和“Disabled”。
- **USB2.0 控制器**
此项用于启用或禁用 USB2.0 控制器。BIOS 自身可能不支持高速 USB。若 BIOS 支持高速 USB，当安装有高速设备时该功能将自动启动。选项为“Enabled”和“Disabled”。
- **USB 工作模式**
将 USB2.0 控制器设置为高速（480 Mbps）或完全速度（12 Mbps）。

- USB 键盘 / 鼠标功能
若要使用 USB 键盘 / 鼠标，请启用此功能。选项为 “Enabled” 和 “Disabled”。
- USB 存储功能
若要使用外部 USB 存储设备在 DOS 模式下启动系统，请启用此功能。选项为 “Enabled” 和 “Disabled”。

3.2.6 Power Management Setup/ 电源管理设定



Note! Adjust “Power management Setup” to configure the system to most effective energy saving still consistent with the intened style of use.



注! 调整电源管理设定将系统配置为最佳省电模式，但仍需与待使用模式相符。



- **Power-Supply Type [ATX]**
This item allows user to set power-supply type, ATX or AT mode.
- **ACPI Function [Enable]**
This item defines the ACPI (Advanced Configuration and Power Management) feature that makes hardware status information available to the operating system, and communicates to PC and system devices for improved power management.
- **ACPI Suspend Type [S3(STR)]**
This item allows user to select sleep state when in suspend.
S1 (POS) The suspend mode is equivalent to a software power down.
S3 (STR) The system shuts down with the exception of a refresh current to the system memory.
- **Run VGA BIOS if S3 Resume [Auto]**
This item allows system to reinitialize VGA BIOS after system resume from ACPI S3 mode.
- **Power Management [User Define]**

This item allows user to select system power saving mode.

Min Saving	Minimum power management. Suspend Mode=1 hr.
Max Saving	Maximum power management. Suspend Mode=1 min.
User Define	Allows user to set each mode individually. Suspend Mode= Disabled or 1 min ~1 hr.

■ Video Off Method [DPMS]

This item allows user to determine the manner in which the monitor is blanked.

V/H SYNC+Blank	This option will cause system to turn off vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

■ Video Off In Suspend [Yes]

This item allows user to turn off video when system is in suspend mode.

■ Suspend Type [Stop Grant]

This item allows user to determine the suspend type.

■ Modem use IRQ [3]

This item allows user to determine which IRQ the MODEM can use.

■ Suspend Mode [Disabled]

This item allows user to set a delay time. If system inactivity exceeds the delay time, all devices except the CPU will be shut off.

■ Soft-Off by PWR-BTTN [Instant-Off]

This item allows user to define function of power button.

Instant-Off	Pressing power button initiates instant power off.
Delay 4 Sec	Press power button for four seconds to initiate power off.

■ PowerOn by LAN [Disabled]

This item allows user to power on the system via LAN. The choices are "Enabled" and "Disabled".

■ PowerOn by Modem [Disabled]

This item allows user to power on the system by Modem. The choices are "Enabled" and "Disabled".

■ USB KB Wake-Up From S3 [Disabled]

This item allows user to allow a USB keyboard to wake up the system from S3 suspend. Options: Enabled or Disabled.

■ PowerOn by Alarm [Disabled]

The choices are "Enabled" and "Disabled". If enabled, the fields that follow indicate dates and times of alarm settings.

■ 电源类型 [ATX]

此项允许用户将电源类型设置为 ATX 或 AT 模式。

■ ACPI 功能 [Enabled]

此项定义了 ACPI（高级配置和电源管理）功能，可将硬件状态信息传达给操作系统显示，并与 PC 和系统设备进行通信，从而提高了电源管理性能。

■ ACPI 挂起类型 [S3 (STR)]

此项允许用户在挂起模式时选择休眠状态。

S1 (POS)	该挂起模式相当于软件关闭。
S3 (STR)	系统关闭，但系统内存进行刷新时除外。

■ **如果 S3 恢复，运行 VGA BIOS [Auto]**

此项允许系统从 ACPI S3 模式回复后重启 VGA BIOS。

■ **电源管理 [User Define]**

此项允许用户选择系统电源省电模式。

Min Saving 最小的电源管理，挂起模式为 1 hr。

Max Saving 最大的电源管理，挂起模式为 1 min。

User Define 允许用户分别设置每种模式。挂起模式为 Disabled 或 1 min ~ 1 hr。

■ **视频关闭模式 [DPMS]**

此项用于选择显示器的关闭模式。

V/H SYNC+Blank 系统将关闭垂直与水平同步信号的输出端口，并向视频缓存区写入空白信号。

Blank Screen 仅向视频缓存区写入空白信号。

DPMS 初始化显示电源设定信号。

■ **在挂起中关闭视频 [Yes]**

当系统处于挂起模式时，视频将会关闭。

■ **挂起类型 [Stop Grant]**

此项允许用户确定挂起类型。

■ **调制解调器使用 IRQ [3]**

此项允许用户确定调制解调器可用的 IRQ。

■ **挂起模式 [Disabled]**

此项允许用户设置一个延迟时间。若系统超过该时间后仍不活跃，CPU 之外的所有设备都会关闭。

■ **通过电源开关软关机 [Instant-Off]**

此项允许用户定义电源按钮功能。

Instant-Off 按一下电源按钮会立刻关机。

Delay 4 Sec 按住开关超过 4 秒钟后系统才会关闭

■ **网络唤醒 [Disabled]**

此项允许用户通过 LAN 进行开机。选项为 “Enabled” 和 “Disabled”。

■ **响铃开机 [Disabled]**

启用此项可使用调制解调器开机功能。选项为 “Enabled” 和 “Disabled”。

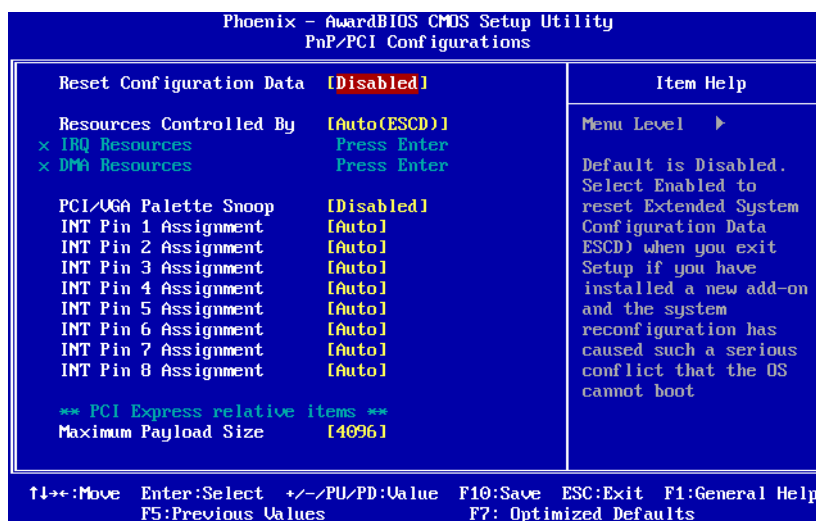
■ **通过 USB 键盘将系统从 S3 状态唤醒 [Disabled]**

选择此项，用户可通过 USB 键盘将系统从 S3 挂起状态唤醒。选项为 “Enabled” 和 “Disabled”。

■ **定时开机 [Disabled]**

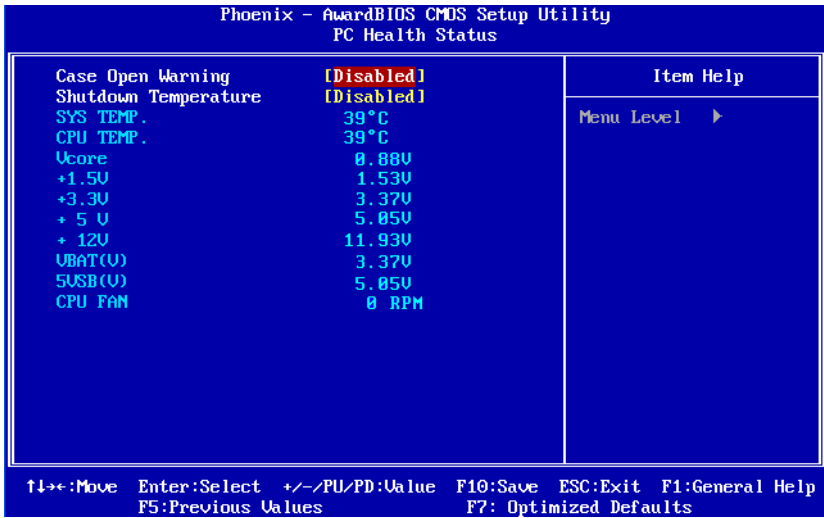
选项为 “Enabled” 和 “Disabled”。启用后，用户可以在此设置开机的日期和时间。

3.2.7 PnP/PCI Configurations/PnP/PCI 配置



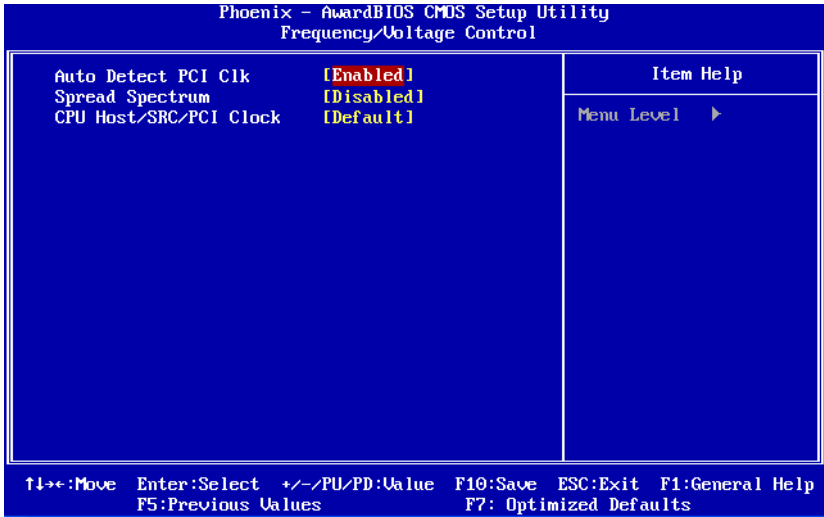
- **Reset Configuration Data [Disabled]**
The default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.
- **Resources Controlled By [Auto(ESCD)]**
The commands here are “Auto(ESCD)” or “Manual”. Choosing “Manual” requires you to choose resources from the following sub-menu. “Auto(ESCD)” automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.
- **PCI/VGA Palette Snoop [Disable]**
This item is designed to solve problems caused by some non-standard VGA cards. A built-in VGA system does not need this function.
- **INT Pin 1-8 Assignment**
This item allows the user to select the interrupt request (IRQ) assigned to a device connected to the PCI Interface on your system.
- **Maximum Payload Size [4096]**
This item allows the user to adjust maximum TLP (Transaction Layer Packet) payload size.
- **重置配置数据 [Disabled]**
默认设置为 “Disable”。如果安装了新的附加卡引起系统配置冲突而导致 OS 不能启动时，选择 “Enable” 可重置扩展系统配置数据（ESCD）。
- **资源控制 [Auto(ESCD)]**
此处的选项为 “Auto (ESCD)” 或 “Manual”。选择 “Manual” 要求用户从下列每个子菜单选择资源。选择 “Auto (ESCD)” 将会自动配置所有启动设备和即用设备，但是用户必须使用 Windows 95 或更高版本的系统。
- **PCI/VGA 调色板配置 [Disabled]**
此项用于解决一些非标准 VGA 卡所造成的问题。内置 VGA 系统不需要此功能。
- **INT 针脚 1-8 定义**
此项允许用户选择用户系统 PCI 接口所连接设备分配的中断请求（IRQ）。
- **最大有效载荷大小 [4096]**
此项允许用户调整最大 TLP（事务层包）有效载荷大小。

3.2.8 PC Health Status/PC 健康状态



- **Case Open Warning [Disable]**
Enable this to detect if the case is open or closed.
- **Shutdown Temperature [Disable]**
The system will shut down automatically if the CPU temperature goes over the selected setting.
- **机箱打开报警 [Disabled]**
启用此项可检测机箱打开或关闭。
- **关机温度 [Disabled]**
当系统超过预设值时系统将自动关机。

3.2.9 Frequency/Voltage Control/ 频率 / 电压控制



- **Auto Detect PCI Clk [Enable]**
This item enables users to set the PCI Clk either by automatic system detection or manually.
- **Spread Spectrum [Disabled]**

This item enables users to set the spread spectrum modulation.

■ **CPU Host/SRC/PCI Clock [Default]**

This item allows users to set the clock ratio of CPU Host/SRC/PCI.

■ **自动检测 PCI 时钟 [Enabled]**

此项允许用户选择通过系统自动检测或手动设置 PCI 时钟。

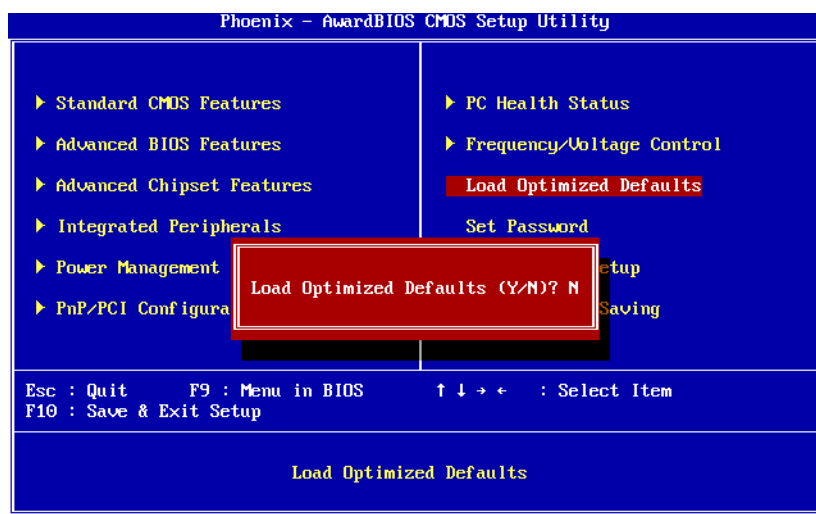
■ **扩展频谱 [Disabled]**

此项允许用户设置扩展频谱调制。

■ **CPU Host/SRC/PCI 时钟 [Default]**

此项允许用户设置 CPU Host/SRC/PCI 时钟频率。

3.2.10 Load Optimized Defaults/ 加载最优化默认设置



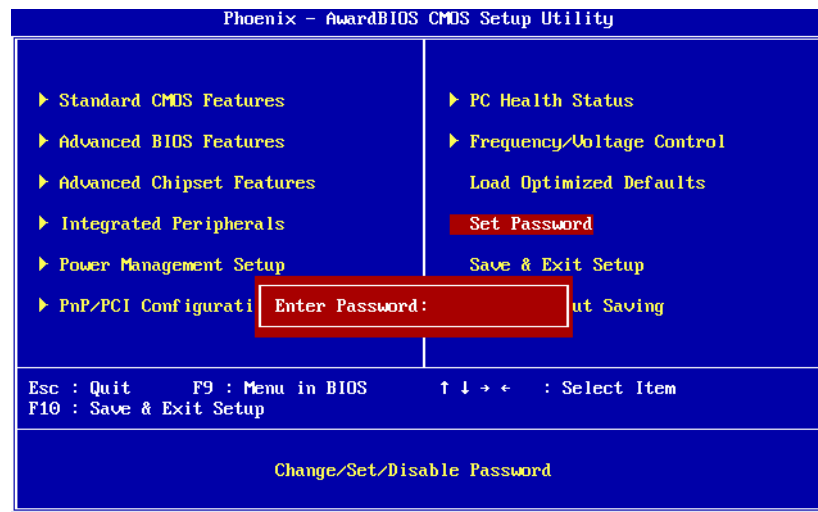
Note! *Load Optimized Defaults loads the default system values directly from ROM. Useful if the stored record created by the Setup program should ever become corrupted (and therefore unusable).*



注! *加载最优化默认设置将从 ROM 中直接加载默认系统值。当设置程序创建的存储记录遭到损坏时该功能会很有用（否则无用）。*



3.2.11 Set Password/ 密码设定



Note! To enable this feature, you should first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. “Setup” requires a password only to enter Setup. “System” requires the password either to enter Setup or to boot the system. A password can be at most 8 characters long.



注! 启用该功能时，用户需首先在高级 BIOS 特性菜单中选择 “Security Option”，然后选择 “Setup” 或 “System”（取决于想要保护的密码类型）。“Setup” 要求密码仅能进入设置。“System” 要求密码即可进入设置，也可启动系统。密码长度不得长于 8 个字节。



To Establish Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password”, enter the desired password and press <Enter>.
3. At the “Confirm Password” prompt, retype the desired password, then press <Enter>.
4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Change Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password”, enter the existing password and press <Enter>.
3. You will see “Confirm Password”. Type it again, and press <Enter>.
4. Select Set Password again, and at the “Enter Password” prompt, enter the new password and press <Enter>.
5. At the “Confirm Password” prompt, retype the new password, and press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Disable Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the existing password and press <Enter>.
3. You will see "Confirm Password". Type it again, and press <Enter>.
4. Select Set Password again, and at the "Enter Password" prompt, please don't enter anything; just press <Enter>.
5. At the "Confirm Password" prompt, again, don't type in anything; just press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

设定密码

1. 从 CMOS 配置工具主菜单中选择 "Set Password" 选项，然后按 <Enter> 键。
2. 看到 "Enter Password" 后，输入想要的密码然后按 <Enter> 键。
3. 弹出 "Confirm Password" 后，再次输入密码然后按 <Enter> 键。
4. 选择 "Save to CMOS and EXIT"，输入 <Y>，然后按 <Enter> 键。

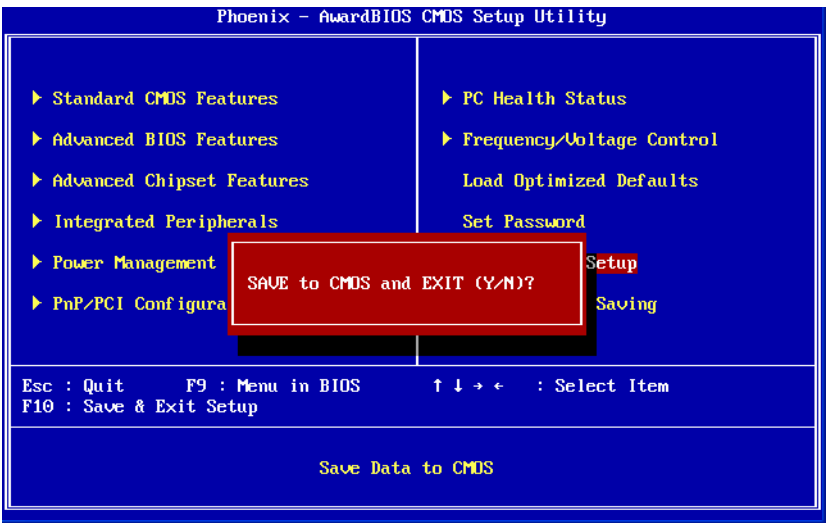
更改密码

1. 从 CMOS 配置工具主菜单中选择 "Set Password" 选项，然后按 <Enter> 键。
2. 看到 "Enter Password" 后，输入当前密码然后按 <Enter> 键。
3. 看到 "Confirm Password" 后，再次输入密码然后按 <Enter> 键。
4. 再次选择 "Set Password"，弹出 "Enter Password" 后，输入新密码并按 <Enter> 键。
5. 弹出 "Confirm Password" 后，再次输入新密码然后按 <Enter> 键。
6. 选择 "Save to CMOS and EXIT"，输入 <Y>，然后按 <Enter> 键。

禁用密码

1. 从 CMOS 配置工具主菜单中选择 "Set Password" 选项，然后按 <Enter> 键。
2. 看到 "Enter Password" 后，输入当前密码然后按 <Enter> 键。
3. 看到 "Confirm Password" 后，再次输入密码然后按 <Enter> 键。
4. 再次选择 "Set Password"，弹出 "Enter Password" 后，不要输入任何字符然后按 <Enter> 键。
5. 弹出 "Confirm Password" 后，不要输入任何字符然后按 <Enter> 键。
6. 选择 "Save to CMOS and EXIT"，输入 <Y>，然后按 <Enter> 键。

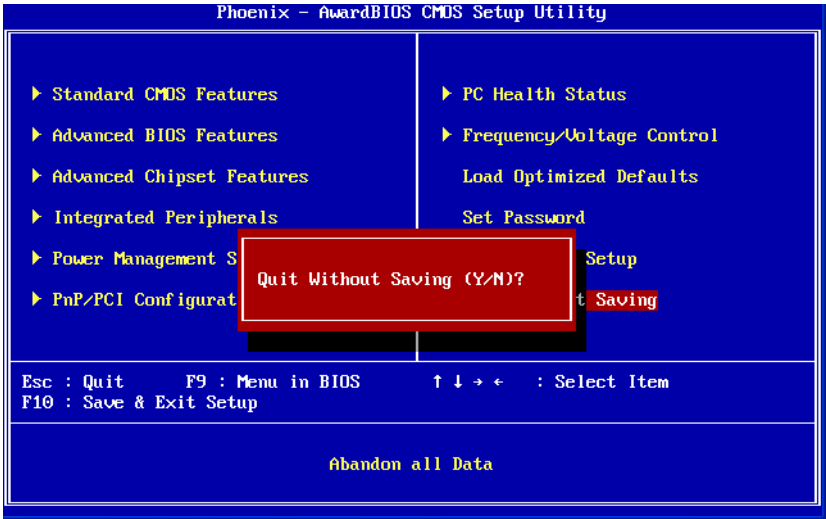
3.2.12 Save & Exit Setup/ 保存并退出设置



Note! Typing “Y” will quit the BIOS Setup Utility and save user setup values to CMOS.
Typing “N” will return to BIOS Setup Utility.

注! 输入 “Y” 将退出 BIOS 配置工具而不会将用户设置数值保存在 CMOS 中。
输入 “N” 将返回 BIOS 配置工具。

3.2.13 Quit without Saving/ 不保存便退出设置



Note! Typing “Y” will quit the BIOS Setup Utility without saving to CMOS.
Typing “N” will return to BIOS Setup Utility.

注! 输入 “Y” 将退出 BIOS 配置工具而不会将用户设置数值保存在 CMOS 中。
输入 “N” 将返回 BIOS 配置工具。

Chapter 4

Chipset Software Installation Utility

芯片组软件安装实用程序

**This chapter describes how to
Installation software and utility.**
本章介绍了如何安装软件和实用程序。

4.1 Introduction/ 简介

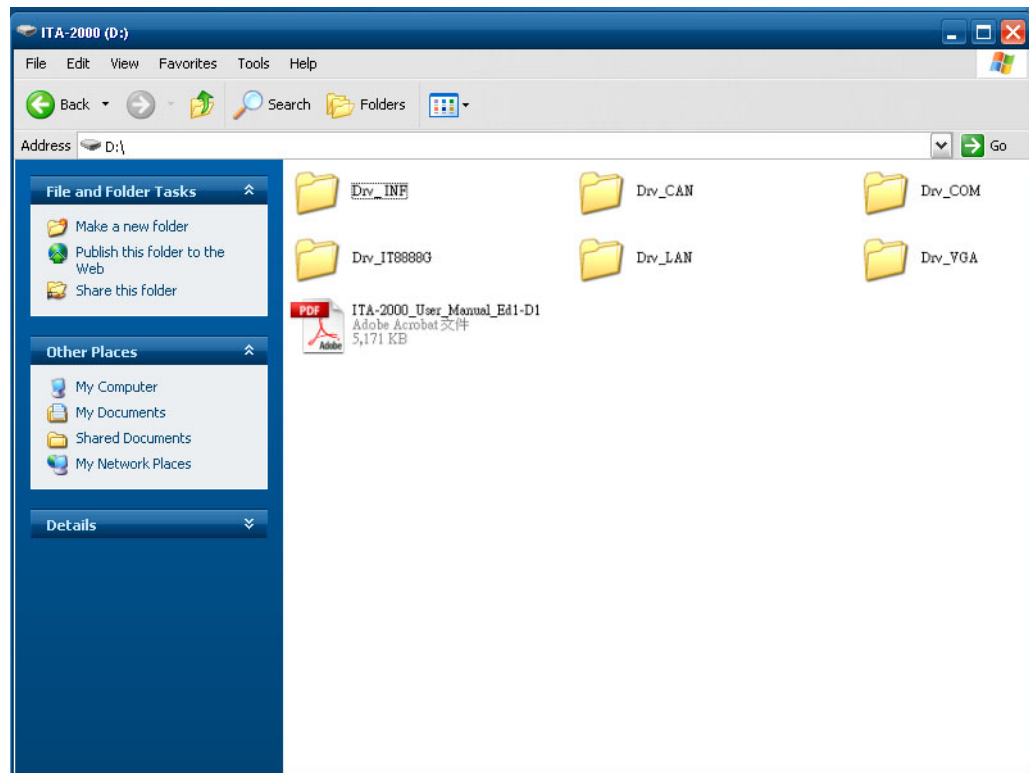
Advantech offers a complete range of Device Driver and software supports for Windows programming developers. You can apply the Windows Device Drivers to the most popular Windows Programming tools, such as Visual C++, Visual Basic, Borland C++ Builder and Borland Delphi.

研华为 Windows 程序开发人员提供了完整的设备驱动和软件。该设备驱动可应用于最通用的 Windows 编程工具中，如 Visual C++、Visual Basic、Borland C++ Builder 和 Borland Delphi。

4.2 Driver Installation/ 驱动安装

Insert the driver CD into your system's CD-ROM drive. You can see the ITA-2000 driver folder items.

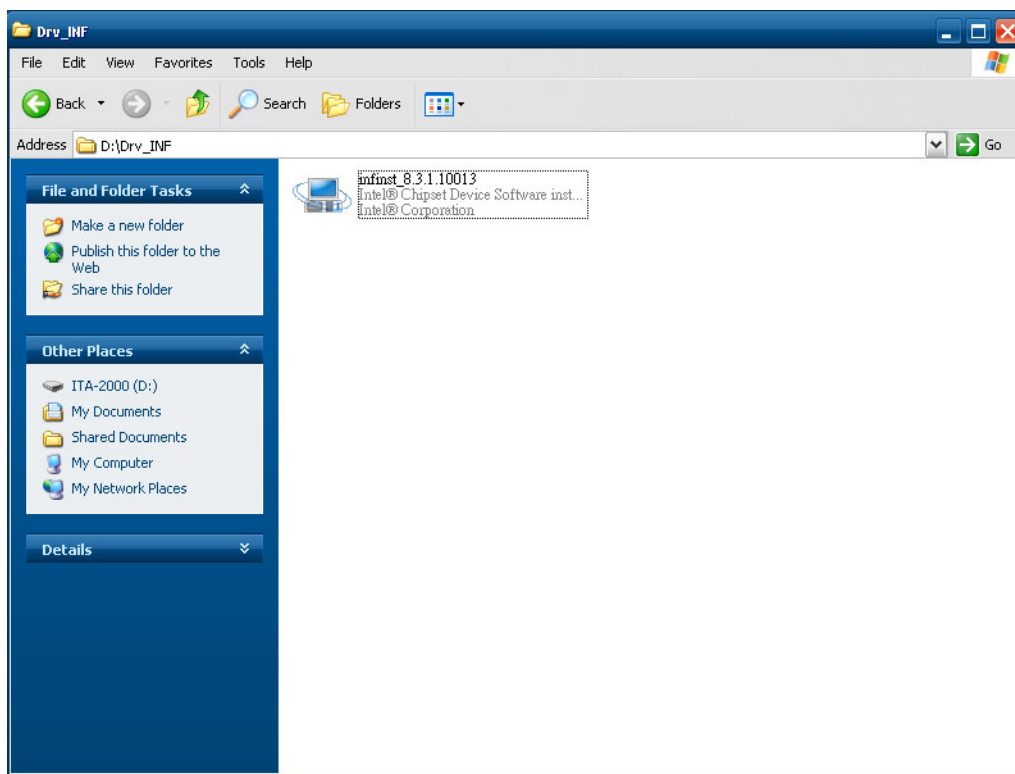
将驱动光盘插入系统 CD-ROM 驱动，用户即可看到 ITA-2000 驱动文件夹。



4.2.1 Chipset Windows Driver Setup/ 芯片组 Windows 驱动安装

Insert the driver CD into your system's CD-ROM drive. You can see the driver folder items. Navigate to the "Drv_INF" folder and click "infinst.exe" to complete the installation of the driver.

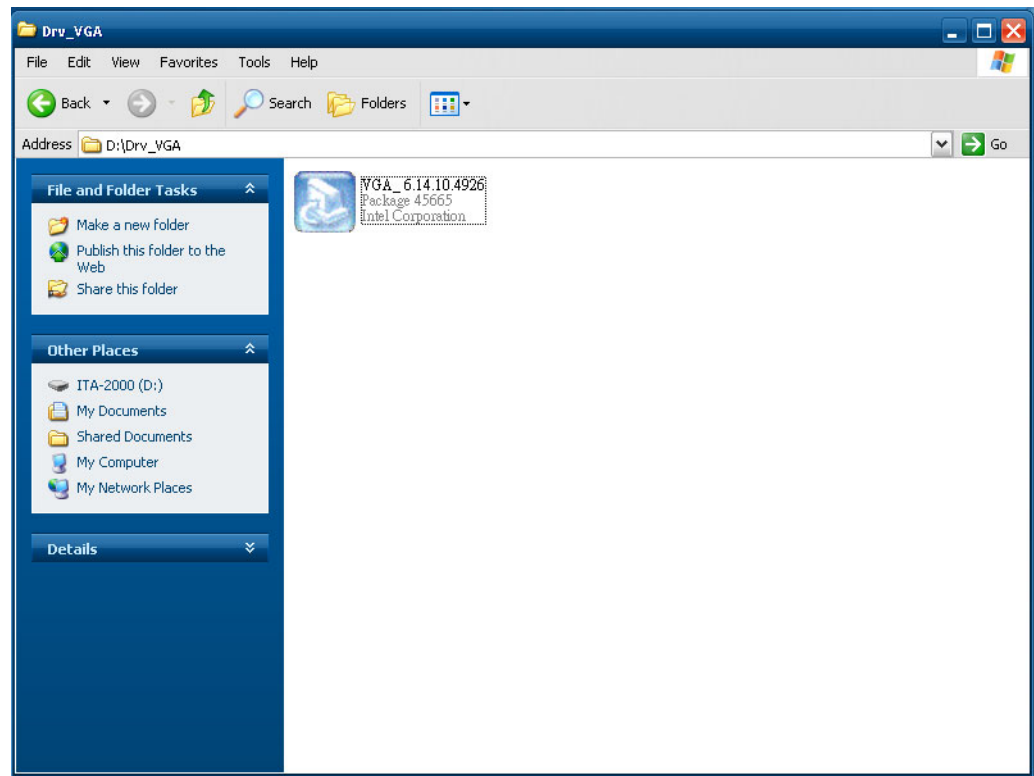
将驱动光盘插入系统 CD-ROM 驱动，用户即可看到 ITA-2000 驱动文件夹。找到“Drv_INF”文件夹然后双击“infinst.exe”完成驱动安装。



4.2.2 VGA Windows Driver Setup/VGA Windows 驱动安装

Insert the driver CD into your system's CD-ROM drive. You can see the driver folders items. Navigate to the "Drv_VGA" folder and click "vga.exe" to complete the installation of the drivers.

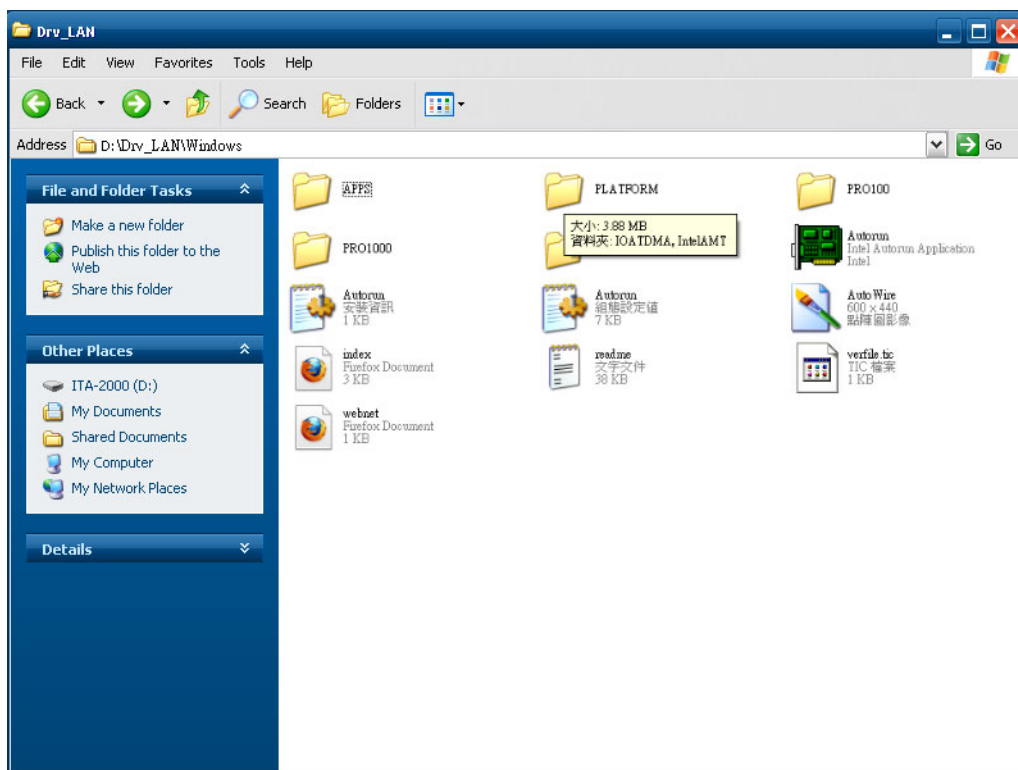
将驱动光盘插入系统 CD-ROM 驱动，用户即可看到 ITA-2000 驱动文件夹。找到“Drv_VGA”文件夹然后双击“vga.exe”完成驱动安装。



4.2.3 LAN Windows Driver Setup/LAN Windows 驱动安装

Insert the driver CD into your system's CD-ROM drive. Select the "Drv_LAN" folder then navigate to the directory for your OS.

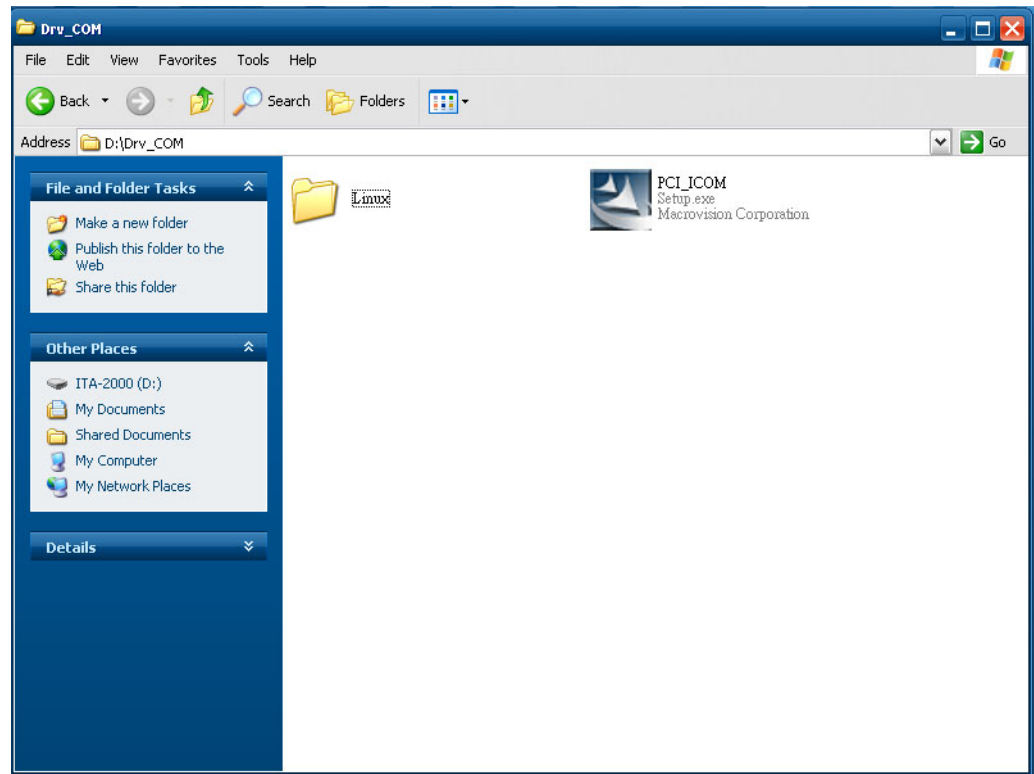
将驱动光盘插入系统 CD-ROM 驱动，选择 “Drv_LAN” 然后找到操作系统目录。



4.2.4 COM Windows Driver Setup/COM Windows 驱动安装

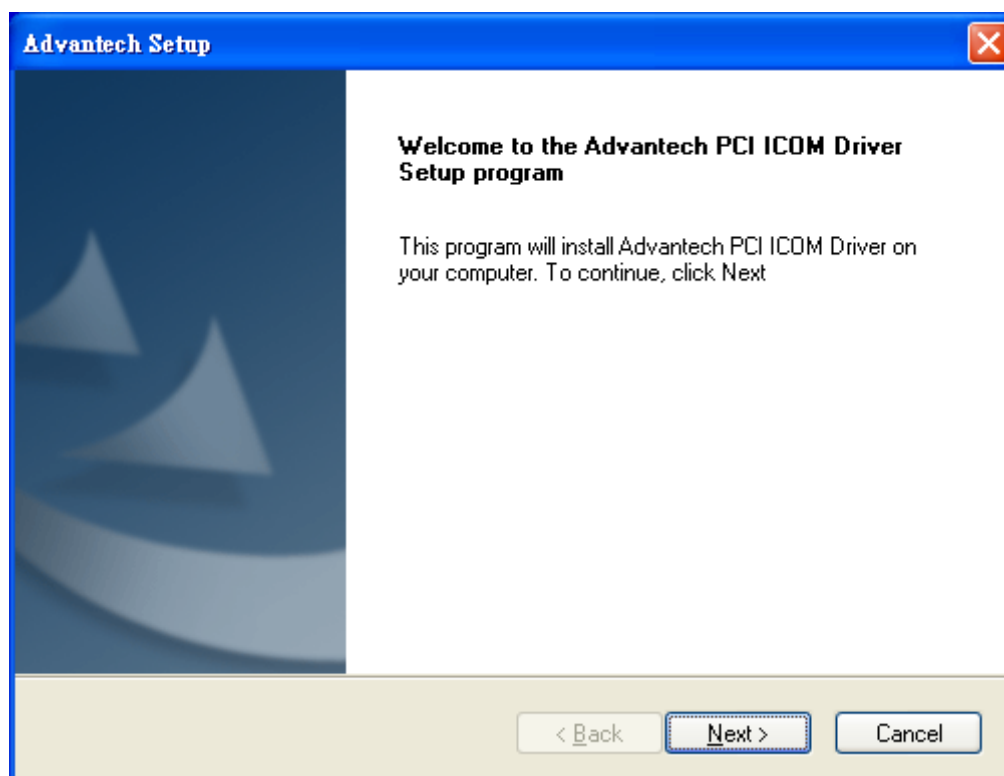
Insert the driver CD into your system's CD-ROM drive. Navigate to the "Drv_COM" folder and click "PCI_COM" to complete the installation of the drivers.

将驱动光盘插入系统 CD-ROM 驱动，找到 “Drv_COM” 文件夹然后双击 “PCI_COM” 完成驱动安装。



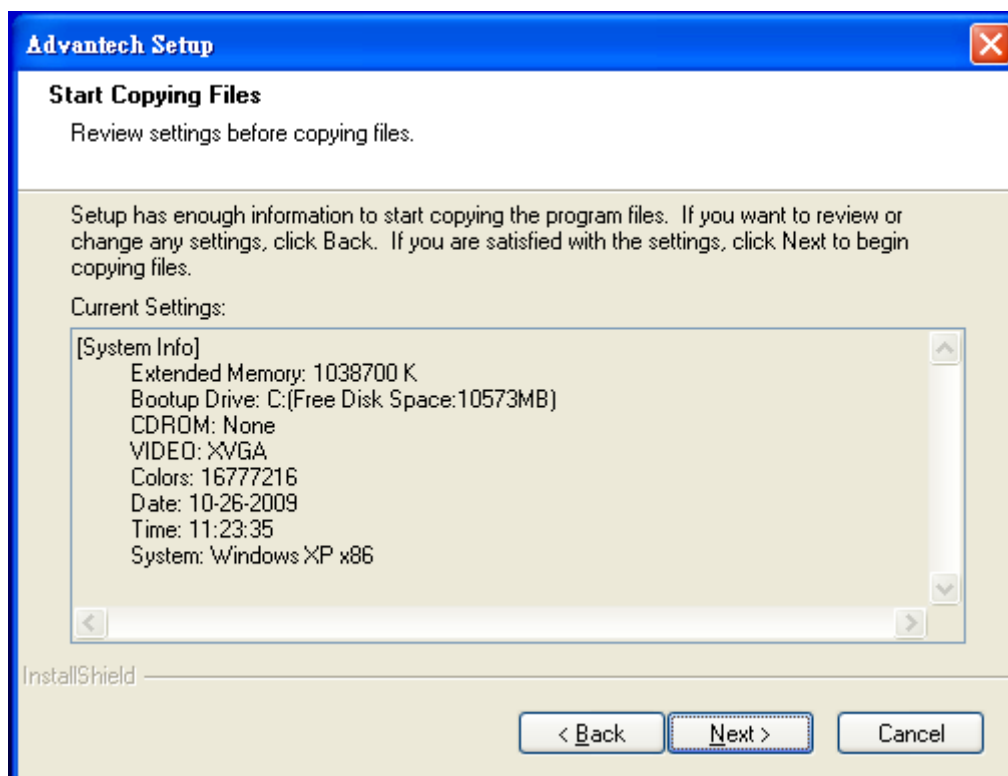
Click “Next” as the following.

点击 “Next”，如下图所示。



Click “Next” as the following.

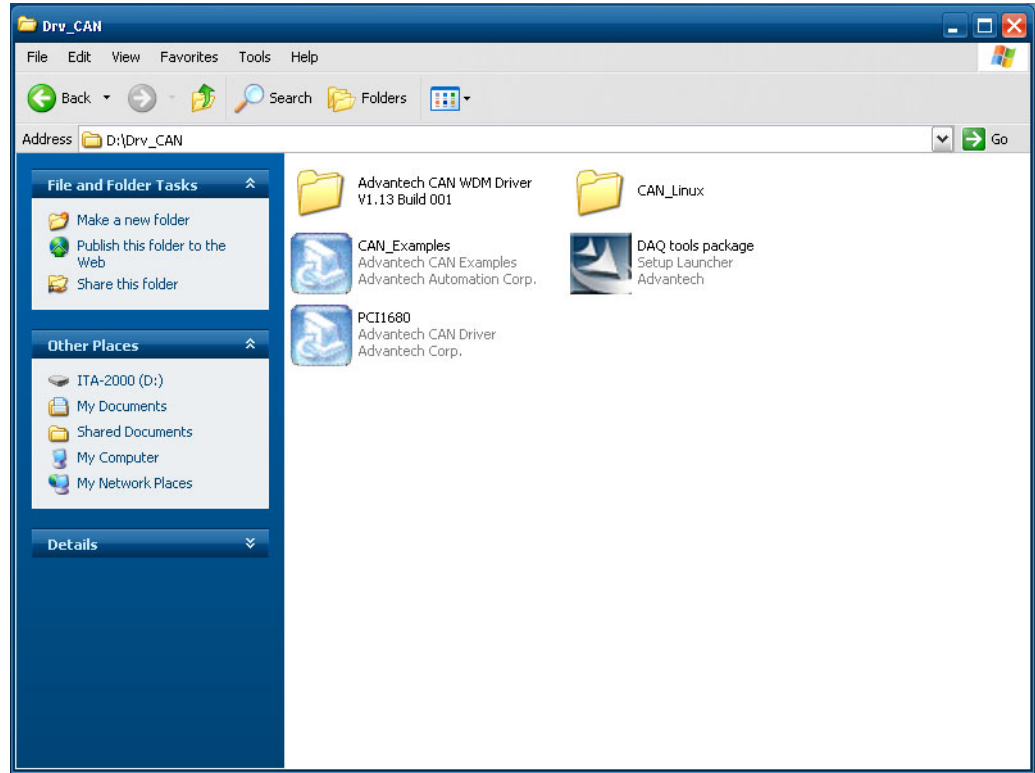
点击 “Next”，如下图所示。



4.2.5 CAN Windows Driver Setup/CAN Windows 驱动安装

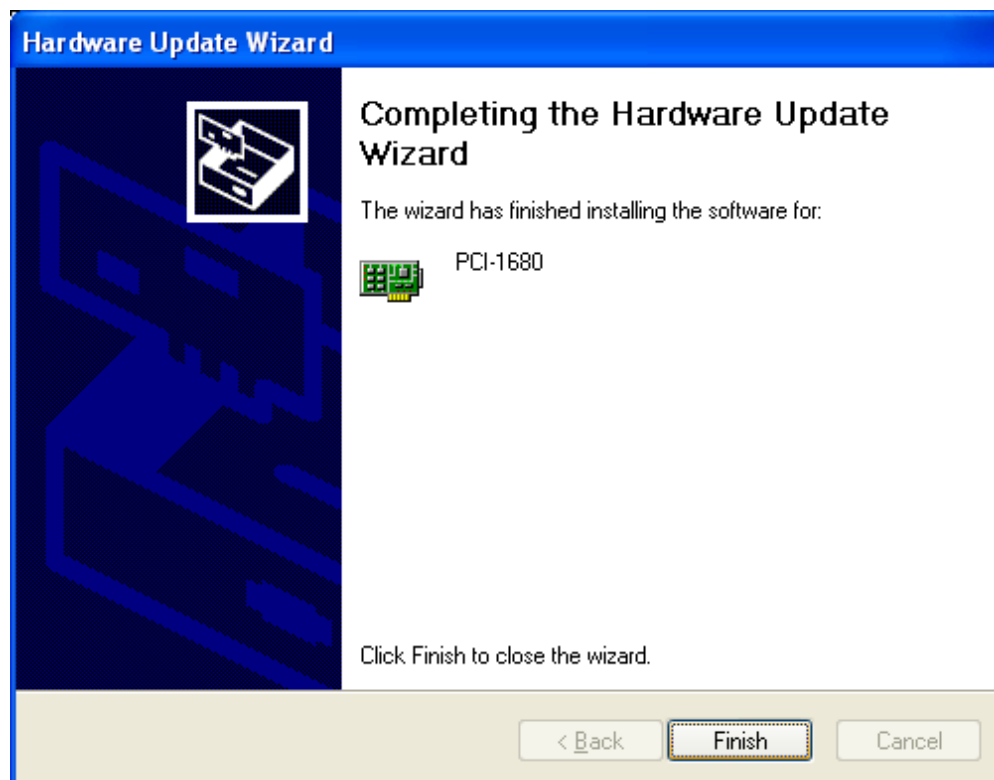
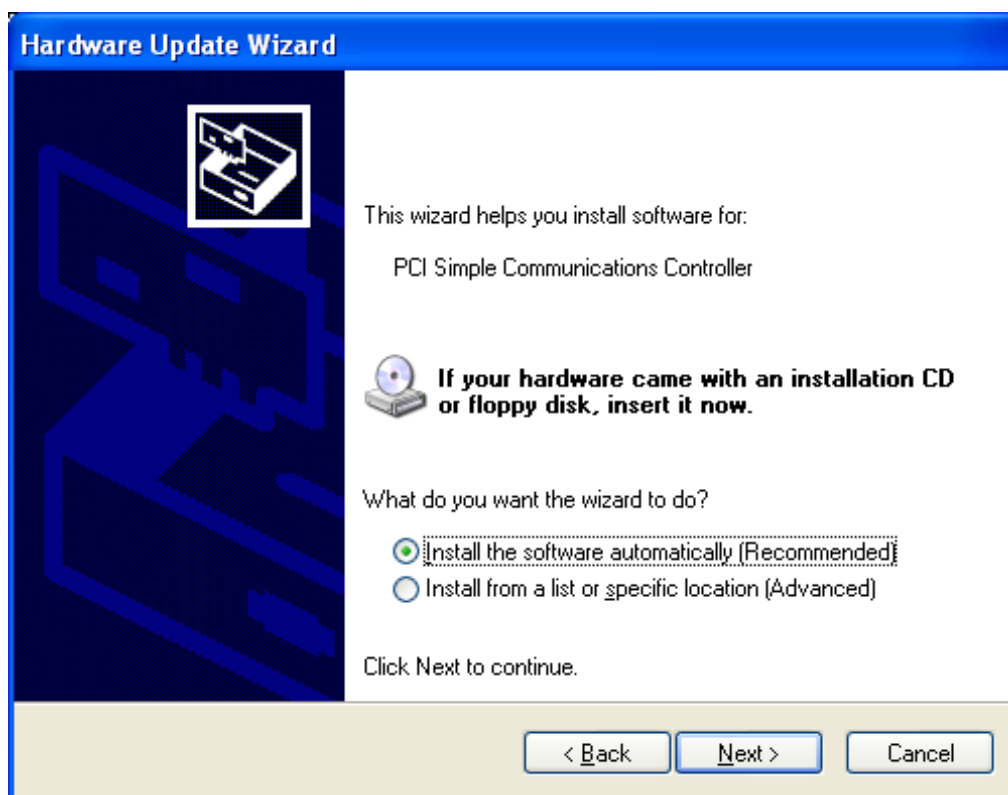
Insert the driver CD into your system's CD-ROM drive. Navigate to the "Drv_CAN" folder and click "PCI1680" to complete the installation of the drivers.

将驱动光盘插入系统 CD-ROM 驱动，找到 “Drv_CAN” 文件夹然后双击 “PCI1680” 完成驱动安装。



First make sure hardware can be installed normally, then turn on the computer and enter operating system. You will see the following screen.

请首先确认硬件已正确安装好，然后打开计算机进入操作系统，即可看到以下界面。



Chapter 5

System Setup 系统安装

This chapter introduces the installation process.
本章介绍了安装过程。

5.1 Introduction/ 简介

The following procedures will instruct you how to install a Memory DIMM, PCI-104 module and disk drive into the ITA-2000 system.

以下步骤将指导用户如何在 ITA-2000 系统中安装内存 DIMM、PCI-104 模块和磁盘驱动。

5.1.1 Removing the Chassis Cover/ 移除机箱顶盖

To remove the chassis cover, please proceed as below.

1. Loosen two screws on the bottom of the top cover. (See Figure 5.1)
2. Pull forward the top cover and then lift it up. (See Figure 5.2)

请按照以下步骤移除机箱顶盖：

1. 卸下顶盖底部的 2 个螺丝。（如图 5.1 所示）
2. 向前拉出然后提起顶盖。（如图 5.2 所示）

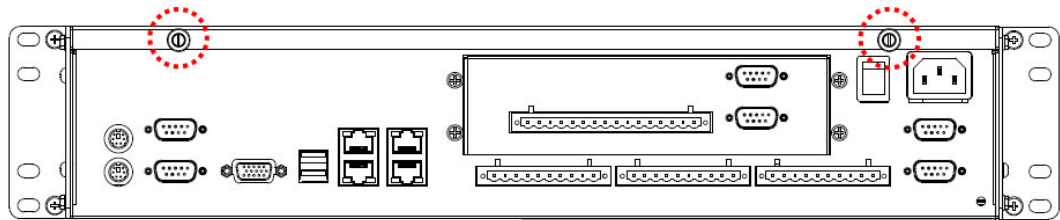


Figure 5.1 Loosen rear two screws/ 卸下后部的 2 个螺丝

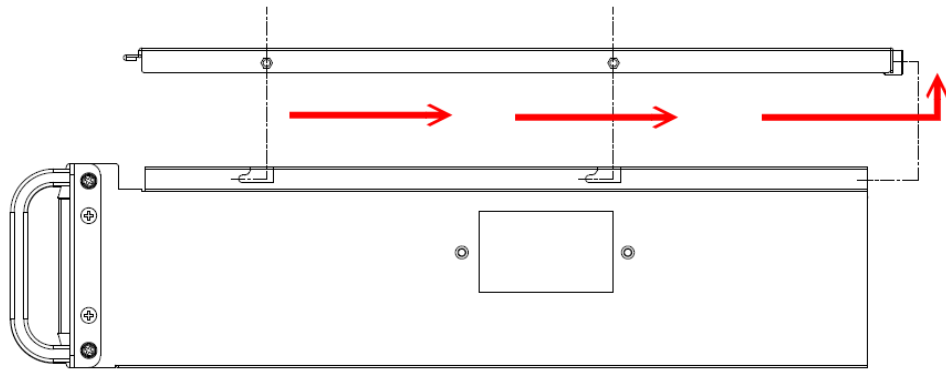


Figure 5.2 Remove the top cover/ 移除顶盖

5.1.2 Installing a Memory DIMM/ 安装内存 DIMM

The ITA-2000 can support DRAM up to 2 G.

To install the DRAM, please proceed as follows

1. Remove chassis cover.
2. Plug in the SODIMM module into the slot as below (See Figure 5.3)

ITA-2000 可支持高达 2 G DRAM。

请按照以下步骤安装 DRAM。

1. 移除机箱顶盖。
2. 将 SODIMM 模块插入插槽中。（如图 5.3 所示）

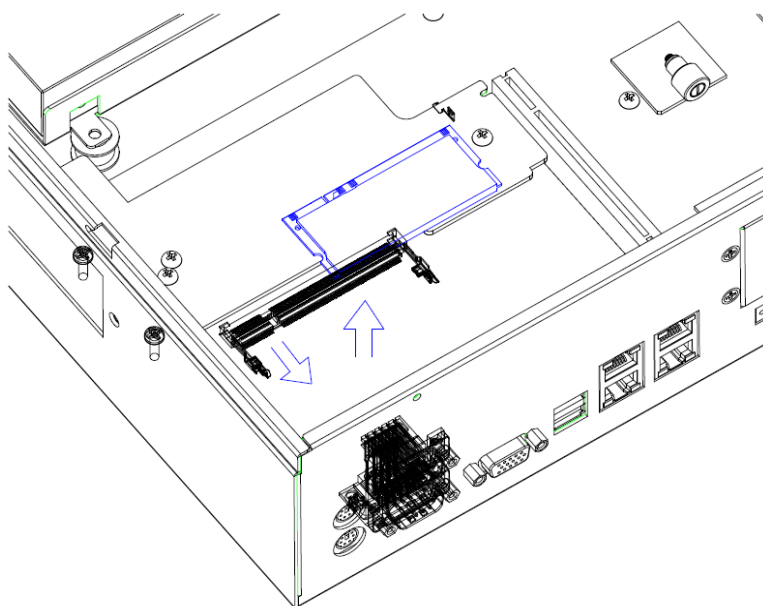


Figure 5.3 Plug in the SODIMM into the slot/ 将 SODIMM 模块插入插槽中

5.1.3 Installing the Disk Drive/ 安装磁盘驱动

The ITA-2000 comes with a shockproof bracket for an internal 2.5" or 3.5" HDD. Please refer to the following instructions to install the hard disk drive.

1. To install the internal HDD, remove the top cover by releasing the two crews.
2. Remove shockproof bracket, loosen the four screws of bracket. (See Figure 5.4)
3. Insert the shockproof bracket into the proper location and secure them with the screws provided.(See Figure 5.5)
4. Connect the SATA cable from the Motherboard.
5. Return the shockproof bracket with the HDD in the original position and fasten it with the four screws.(See Figure 5.6)

ITA-2000 带有 1 个内部 2.5" 或 3.5" HDD 防冲击支架。请参考以下指导安装 HDD。

1. 安装内部 HDD 时，请卸下顶盖上的 2 个螺丝并将其移除。
2. 移除防冲击支架，卸下支架上的 4 个螺丝。（如图 5.4 所示）
3. 将防冲击支架插入合适的位置并用提供的螺丝将其固定。（如图 5.5 所示）
4. 连接主板上的 SATA 电缆。
5. 将 HDD 和防冲击支架放回原位并用原来的 4 个螺丝将其固定。（如图 5.5 所示）

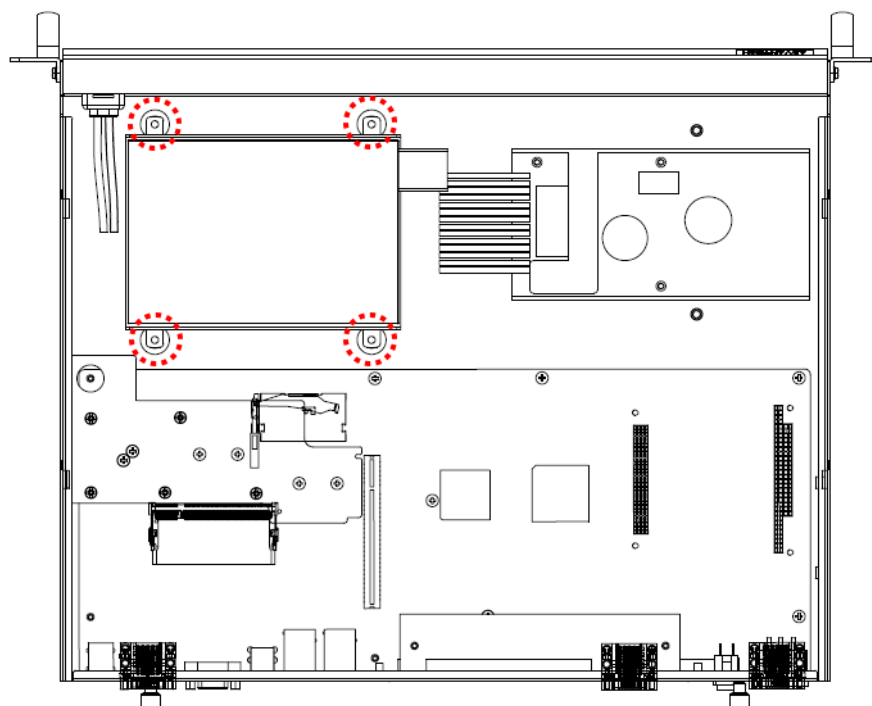


Figure 5.4 Loosen the four screws on the shockproof bracket/ 卸载防冲击支架上的 4 个螺丝

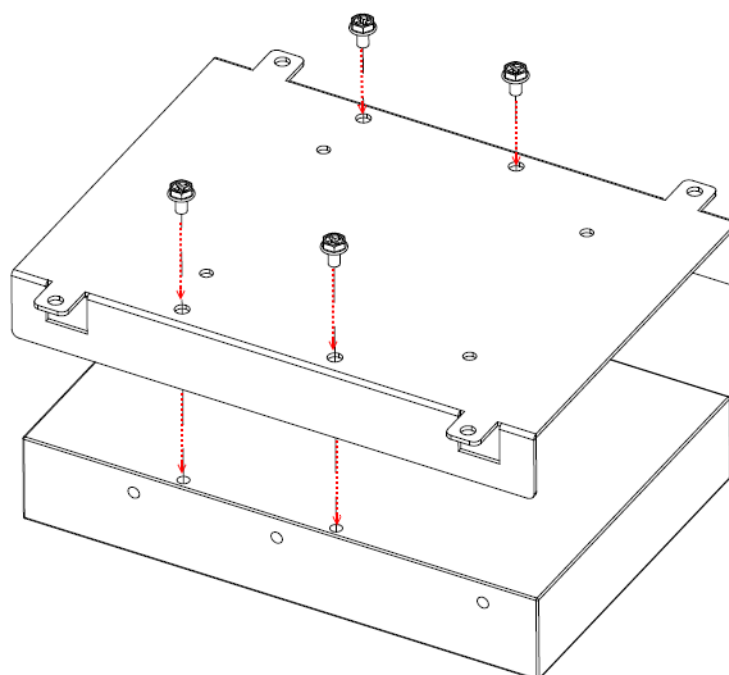


Figure 5.5 Installing a Hard Disk into the shockproof bracket/ 将HDD安装在防冲击支架上

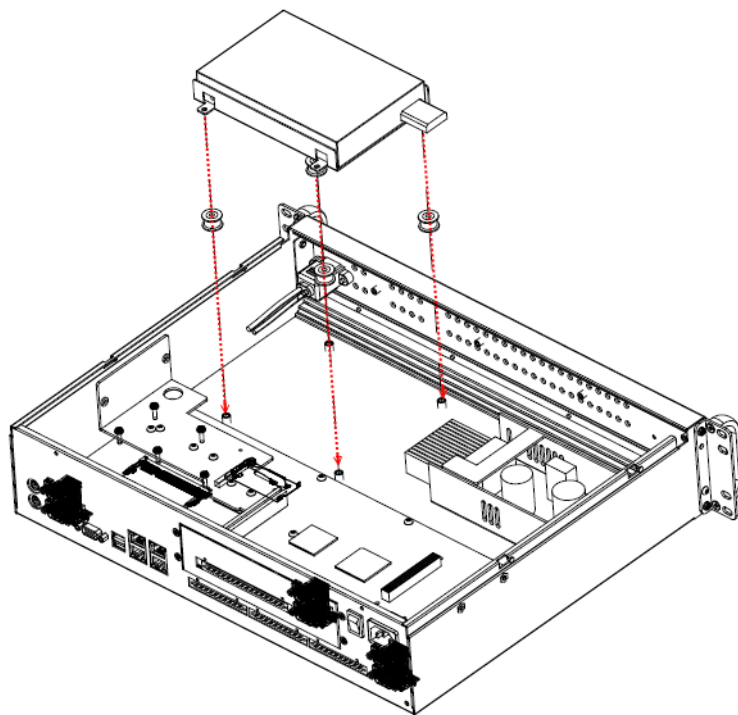


Figure 5.6 Return the shockproof bracket with HDD into system/ 将HDD 和防冲击支架放回系统中

5.1.4 Installing a PCI-104 Module/ 安装 PC-104 模块

The ITA-2000 supports PCI-104 modules depending on the Motherboard specification. To install the module, just simply insert the module to the corresponding slot as follows:

ITA-2000 是否支持 PC-104 模块，取决于主板规格。安装模块时，仅需将模块插入合适的插槽中，如下图所示：

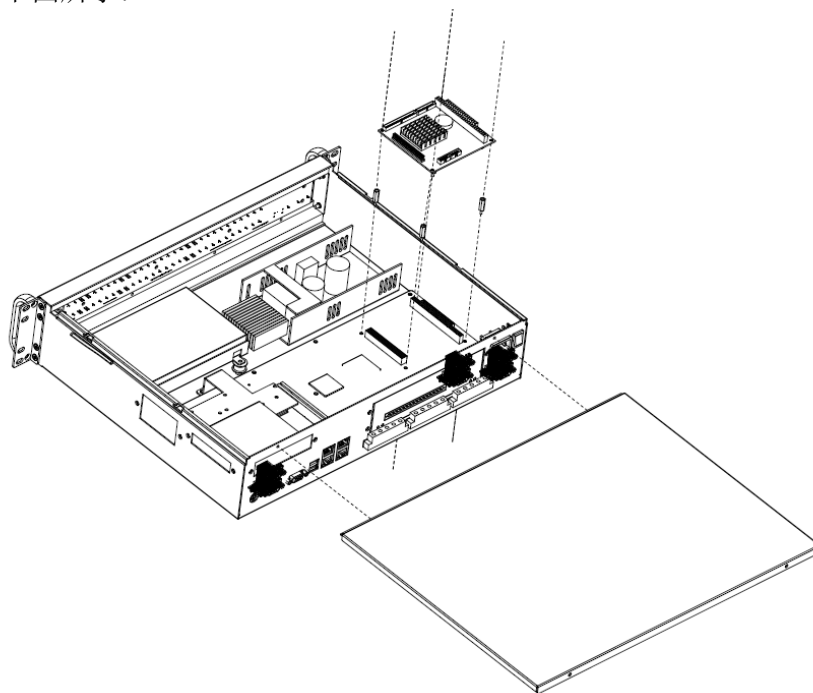


Figure 5.7 Installing PCI 104 modules/ 安装 PCI 104 模块

5.1.5 Installing the Compact Flash/ 安装 CF

The ITA-2000 supports one internal CF slot for Compact Flash card type I/II. To install the card, please proceed as follows:

1. Turn the chassis to bottom side and look for the square cover with 4 screws
2. Loosen the four screws; remove the cover and you will see the CF card slot. Plug the CF card into the slot.
3. Put the cover back and secure with the screws.

ITA-2000 带有 1 个内部 CF 插槽，支持 CF 卡 type I/II。请按照以下步骤安装卡：

1. 将机箱底部朝上，并找到带有 4 个螺丝的方盖。
2. 卸载盖上的 4 个螺丝并将其移除，用户即可看到 CF 卡插槽。将 CF 卡插入插槽中。
3. 将方盖放回原位并用螺丝固定。

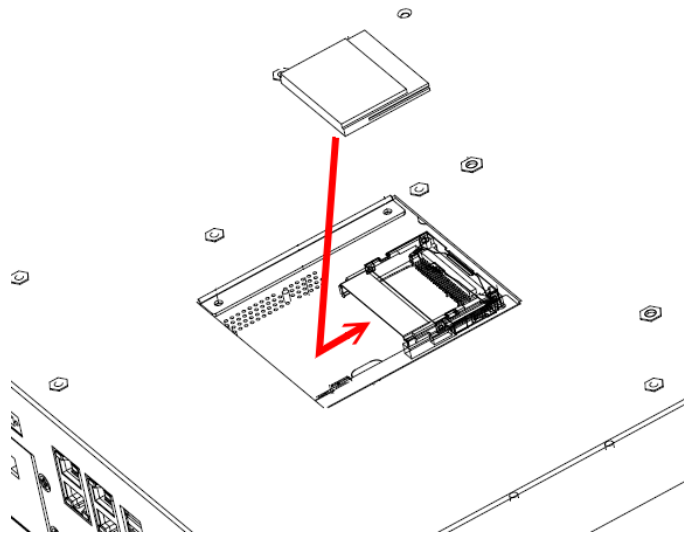


Figure 5.8 Plug the CF Card into slot/ 将 CF 卡插入插槽

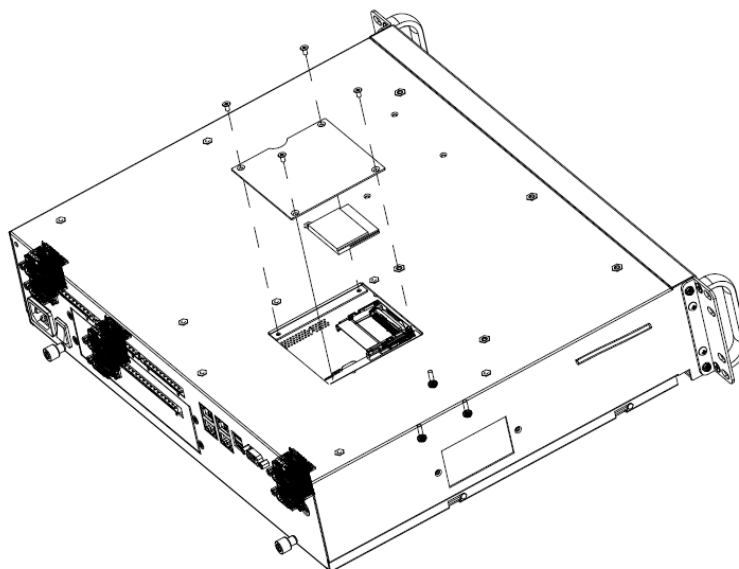


Figure 5.9 Put the cover back and secure with the screws/ 将方盖放回原位并用螺丝固定

Appendix **A**

**Programming the
Watchdog Timer**
看门狗定时器编程

A.1 Programming the Watchdog Timer/看门狗定时器编程

The ITA-2000's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

ITA-2000 看门狗定时器可用于监控系统软件操作，并在编程过程中出现软件故障时采取适当措施。本章节介绍了看门狗定时器操作以及如何编程。

A.1.1 Watchdog Timer Overview/看门狗定时器概述

The watchdog timer is built into the super I/O controller W83627DHG. It provides the following user-programmable functions:

- Can be enabled or disabled via user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

看门狗定时器内置于高级 I/O 控制器 W83627DHG，提供了以下用户可编程功能：

- 可通过用户编程启用或禁用
- 定时器可设置为 1 ~ 255 秒或 1 ~ 255 分钟。
- 在软件复位定时器超时时产生中断或复位信号

A.1.2 Programming the Watchdog Timer/编程看门狗定时器

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first assign the address of register by writing an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

看门狗定时器的 I/O 端口地址为 2E (hex) 和 2F (hex)。2E (hex) 为地址端口。2F (hex) 为数据端口。用户必须首先通过向地址端口 2E (hex) 写入一个地址值分配一个寄存器地址，然后通过数据端口 2F (hex) 向 / 从分配的寄存器写入 / 读取数据。

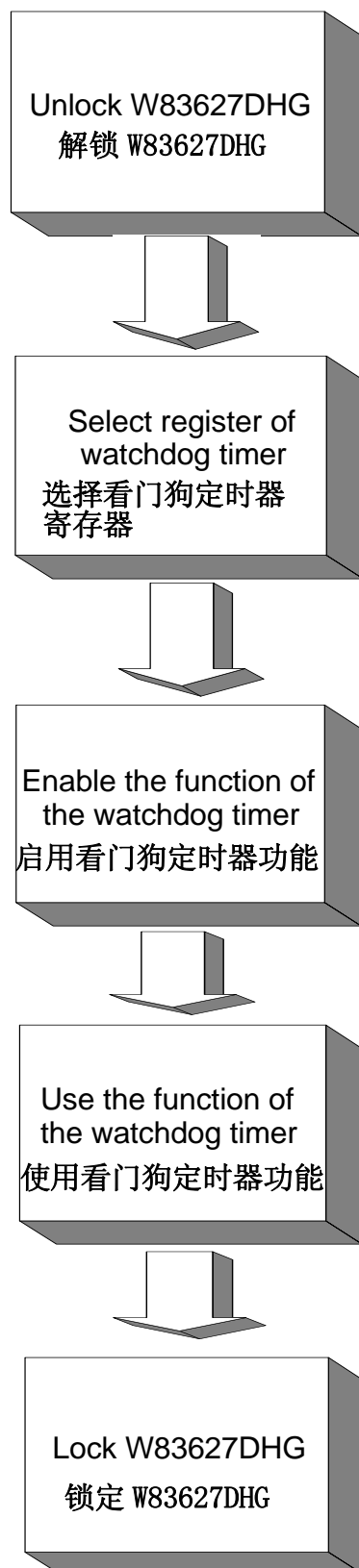


Table A.1: Watchdog Timer Registers/ 看门狗定时器寄存器

Address of Register (2E) 寄存器 (2E) 地址	Attribute 属性	
Read/Write 读取 / 写入	Value (2F) & description 数值 (2F) & 说明	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627DHG. 向 I/O 地址端口 2E (hex) 写入该地址两次，解锁 W83627DHG。
07 (hex)	write 写入	Write 08 (hex) to select register of watchdog timer. 写入 08 (hex) 选择看门狗定时器寄存器。
30 (hex)	write 写入	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default. 写入 01 (hex) 启用看门狗定时器功能。默认为禁用。
F5 (hex)	write 写入	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default] Write 1 to bit 3: set minutes as counting unit. 将定时器计时单位设置为秒或分钟： 向 bit 3 写入 0：将计时单位设置为秒。（默认） 向 bit 3 写入 1：将计时单位设置为分钟。
F6 (hex)	write 写入	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value. 0: 停止定时器（默认）。 01~FF (hex)：计时值，单位为秒或分钟，取决于寄存器 F5 (hex) 的设置值。该值说明了看门狗定时器等待选通的时间达到何值时产生中断或复位信号。向该寄存器写入新值可以复位定时器，使其以新值开始计时。
F7 (hex)	read/write 读取 / 写入	Bit 7: Write 1 to enable mouse to reset the timer, 0 to disable [default]. Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable. [default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "time-out". Bit 7: 写入 1 启用鼠标复位定时器，写入 0 禁用（默认）。 Bit 6: 写入 1 启用键盘复位定时器，写入 0 禁用（默认）。 Bit 5: 写入 1 立即产生超时信号，并自动返回到 0（默认为 0）。 Bit 4: 读取看门狗定时器状态，1 表示定时器“超时”。
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2. 向 I/O 端口 2E (hex) 写入该地址，锁定看门狗定时器 2。

A.1.3 Example Program/ 编程示例

1. Enable watchdog timer and set 10 sec. as timeout interval

```

;-----
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Set second as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;-----
Dec dx ; Set timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;-----
Dec dx ; Lock W83627DHG
Mov al,0aah
Out dx,al

```

2. Enable watchdog timer and set 5 minutes as timeout interval

```

;-----
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al

```

```

;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Set minute as counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;-----
Dec dx ; Set timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;-----
Dec dx ; Lock W83627DHG
Mov al,0aah
Out dx,al
3. Enable watchdog timer to be reset by mouse
;-----
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----

```



```

Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Enable watchdog timer to be reset by mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;-----
Dec dx ; Lock W83627DHG
Mov al,0aah
Out dx,al
4. Enable watchdog timer to be reset by keyboard
;-----
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Enable watchdog timer to be strobed reset by keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al

```

```

;-----
Dec dx ; Lock W83627DHG
Mov al,0aah
Out dx,al
5.   Generate a time-out signal without timer counting
;-----
Mov dx,2eh ; Unlock W83627DHG
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h ; Select registers of watchdog timer
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;-----
Dec dx ; Enable the function of watchdog timer
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;-----
Dec dx ; Generate a time-out signal
Mov al,0f7h
Out dx,al ;Write 1 to bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;-----
Dec dx ; Lock W83627DHG
Mov al,0aah
Out dx,al

```

1. 启用看门狗定时器，并将超时间隔设置为 10 秒。

```

;-----
Mov dx, 2eh ; 解锁 W83627DHG
Mov al, 87h
Out dx, al
Out dx, al
;-----
Mov al, 07h ; 选择看门狗定时器寄存器
Out dx, al
Inc dx
Mov al, 08h
Out dx, al
;-----
Dec dx ; 启用看门狗定时器功能
Mov al, 30h
Out dx, al
Inc dx
Mov al, 01h
Out dx, al
;-----
Dec dx ; 将计时单位设置为秒
Mov al, 0f5h
Out dx, al
Inc dx
In al, dx
And al, not 08h
Out dx, al
;-----
Dec dx ; 将超时间隔设置为 10 秒然后开始计时
Mov al, 0f6h
Out dx, al
Inc dx
Mov al, 10
Out dx, al
;-----
Dec dx ; 锁定 W83627DHG
Mov al, 0aah
Out dx, al

```

2. 启用看门狗定时器功能并将超时间隔设置为 5 分钟。

```

;-----
Mov dx, 2eh ; 锁定 W83627DHG
Mov al, 87h
Out dx, al
Out dx, al
;-----

```

```

Mov al, 07h ; 选择看门狗定时器寄存器
Out dx, al
Inc dx
Mov al, 08h
Out dx, al
;-----
Dec dx ; 启用看门狗定时器功能
Mov al, 30h
Out dx, al
Inc dx
Mov al, 01h
Out dx, al
;-----
Dec dx ; 将计时单位设置为分钟
Mov al, 0f5h
Out dx, al
Inc dx
In al, dx
Or al, 08h
Out dx, al
;-----
Dec dx ; 将超时间隔设置为 5 分钟，然后开始计时
Mov al, 0f6h
Out dx, al
Inc dx
Mov al, 5
Out dx, al
;-----
Dec dx ; 锁定 W83627DHG
Mov al, 0aah
Out dx, al
3. 启用鼠标复位看门狗定时器功能。
;-----
Mov dx, 2eh ; 锁定 W83627DHG
Mov al, 87h
Out dx, al
Out dx, al
;-----
Mov al, 07h ; 选择看门狗定时器寄存器
Out dx, al
Inc dx
Mov al, 08h
Out dx, al
;-----
Dec dx ; 启用看门狗定时器功能

```

```

Mov al, 30h
Out dx, al
Inc dx
Mov al, 01h
Out dx, al
;-----
Dec dx ; 启用鼠标复位看门狗定时器功能
Mov al, 0f7h
Out dx, al
Inc dx
In al, dx
Or al, 80h
Out dx, al
;-----
Dec dx ; 锁定 W83627DHG
Mov al, 0aah
Out dx, al
4. 启用键盘复位看门狗定时器功能。
;-----
Mov dx, 2eh ; 锁定 W83627DHG
Mov al, 87h
Out dx, al
Out dx, al
;-----
Mov al, 07h ; 选择看门狗定时器寄存器
Out dx, al
Inc dx
Mov al, 08h
Out dx, al
;-----
Dec dx ; 启用看门狗定时器功能
Mov al, 30h
Out dx, al
Inc dx
Mov al, 01h
Out dx, al
;-----
Dec dx ; 启用键盘复位看门狗定时器功能
Mov al, 0f7h
Out dx, al
Inc dx
In al, dx
Or al, 40h
Out dx, al
;-----

```

```

Dec dx ; 锁定 W83627DHG
Mov al, 0aah
Out dx, al
5. 定时器不计时时, 产生超时信号
;-----
Mov dx, 2eh ; 解锁 W83627DHG
Mov al, 87h
Out dx, al
Out dx, al
;-----
Mov al, 07h ; 选择看门狗定时器寄存器
Out dx, al
Inc dx
Mov al, 08h
Out dx, al
;-----
Dec dx ; 启用看门狗定时器功能
Mov al, 30h
Out dx, al
Inc dx
Mov al, 01h
Out dx, al
;-----
Dec dx ; 产生超时信号
Mov al, 0f7h
Out dx, al ; 向 F7 寄存器 bit 5 写入 1
Inc dx
In al, dx
Or al, 20h
Out dx, al
;-----
Dec dx ; 锁定 W83627DHG
Mov al, 0aah
Out dx, al

```

Appendix **B**

**Examples of the CAN
Transfer tool**

CAN 转换工具示例

B.1 Examples of the CAN Transfer Tool and Programming/CAN 转换工具和编程示例

Advantech CAN Windows WDM&CE Driver package contains examples of VC, VB, VB.NET, C#.NET, VC.NET, eVC. Users can refer to these examples to develop applications.

研华 CAN Windwos WDM&CE 驱动包包含 VC、VB、VB.NET、C#.NET、VC.NET 和 eVC。用户可参考这些示例开发应用。

B.1.1 WDM & CE

Example Name 示例名	Description 说明	VC	VB	VB.NET	C#.NET	VC.NET
Can_Configure	This example shows how to configure each item of CAN port. 该示例说明了如何配置 CAN 端口的每一项。	Yes	Yes	Yes	Yes	Yes
Can_Send	This example shows how to send data to CAN port. 该示例说明了如何向 CAN 端口发送数据。	Yes	Yes	Yes	Yes	Yes
Can_Receive	This example shows how to receive data from CAN port. 该示例说明了如何从 CAN 端口接收数据。	Yes	Yes	Yes	Yes	Yes
Can_Event	This example shows how to receive/send data from/to CAN port through events in the way similar to serial port communication. 该示例说明了如何以与串行端口通信相似的方法向 / 从 CAN 端口发送 / 接收数据。	Yes	Yes	Yes	Yes	Yes

B.1.2 Configure/ 配置

Before you begin, please enter the name of the port you have installed in the textbox of CAN Port, such as can0, can1, etc. Select the value of the Baud Rate that you want in the dropdown list for the Baud Rate (The default value is 125 k). Select Single or Dual in the Acceptance Filter Mode. Enter filter mask for receiving data in the fields of Acceptance Mask and Acceptance Code (The default value is 0xFFFFFFFF). Type values of timeout in Write Timeout and Read Timeout fields (The default value is 3000 ms). After configuring the above items, users can click the "Configure" button to change the current setting of the port.

After clicking the "Configure" button, a successful message and the new configuration information will be displayed if you succeed. In addition, the number of received data and values of controllers will be displayed as well. If the configuration fails, a message will be displayed.

开始前，请在“CAN Port”文本框中输入已安装端口名，如 can0、can1 等。在“Baud Rate”下拉列表中选择想要的波特率值（默认值为 125 K）。选择“Acceptance Filter Mode”（验收过滤器模式）为“Single”（单）或“Dual”（双）。在“Acceptance Mask”（验收屏蔽）和“Acceptance Code”（验收编码）区域输入用于接收数据的滤镜遮罩（默认为 0xFFFFFFFF）。在“Write Timeout”（写入超时）和“Read Timeout”（读取超时）区域输入超时值（默认为 3000 ms）。完成上述设置后，用户可点击“Configure”按钮改变端口的当前设置。

点击“Configure”按钮后，若设置成功，将会出现成功信息提示并显示新的配置信息。此外，所接收的数据数量和控制器的数值也会显示出来。若设置失败，将出现错误信息提示。

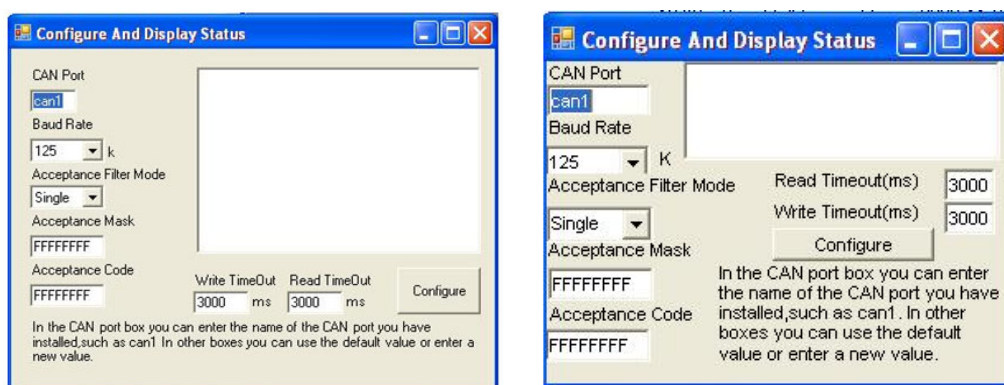


Figure B.1 CAN WDM&CE configure setting/CAN WDM&CE 配置

B.1.3 Send/ 发送

Before you begin, please enter the name of the port you have installed in the textbox of CAN Port, such as can0, can1, etc. Select value of the Baud Rate that you want in dropdown list of Baud Rates (The default value is 125 k). Type in the timeout value in Timeout field (The default value is 3000 ms). Selecting Self Receive check box can realize the self reception function. On WDM platform, the user can select either synchronous mode or asynchronous mode. While on CE platform, only synchronous mode is supported. After configuring the above items, users can click "Start" button to send data (100 frames are sent by default).

After clicking the "Start" button, the name of the button will change to "Stop". At the same time, results of sent frames will be shown in the textbox on the right. Users can click the "Stop" button to stop sending frames (100 frames are sent by default) during the process, then the name of the button will return to "Start" for the next send operation.

开始前，请在“CAN Port”文本框中输入已安装端口名，如 can0、can1 等。在“Baud Rate”下拉列表中选择想要的波特率值（默认值为 125 K）。在“Timeout”区域输入超时值（默认为 3000 ms）。选定“Self Receive”复选框启用自发自收功能。在 WDM 平台中，用户可选择“synchronous”（同步）或“asynchronous”（异步）模式。在 CE 平台中，仅支持“synchronous”模式。完成上述设置后，用户可点击“Start”按钮开始发送数据（默认发送 100 帧）。

点击“Start”按钮后，按钮名称变为“Stop”。同时帧发送结果也将显示在右边的文本框中。用户可在发送过程中点击“Stop”按钮停止帧发送（默认发送 100 帧），然后按钮名将重新变为“Start”，准备下一次发送。

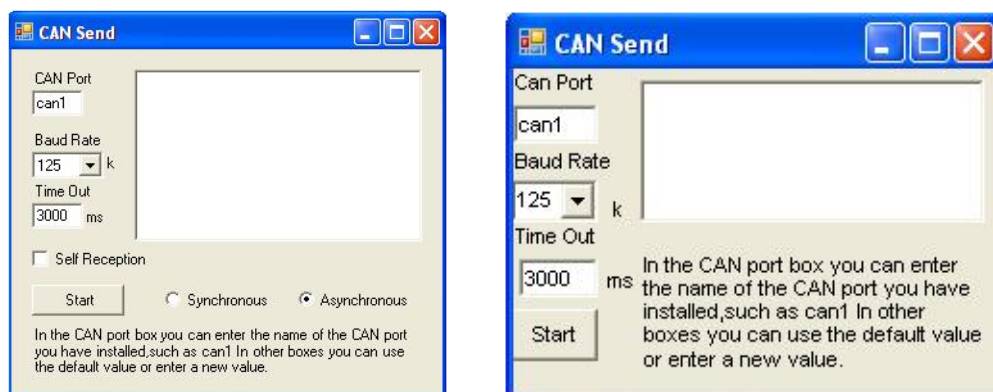


Figure B.2 CAN Send test of WDM&CE/CAN WDM&CE 发送测试

B.1.4 Receive/ 接收

Before you begin, please enter the name of the port you have installed in the textbox of the CAN Port, such as can0, can1, etc. Select the value of the Baud Rate that you want in the Baud Rate dropdown list (The default value is 125 k). Type in the value of timeout in the Timeout field (The default value is 3000 ms). On WDM platform, the user can select either synchronous mode or asynchronous mode. While on CE platform, only synchronous mode is supported. After configuring the above items, users can click the "Start" button to receive data. (100 frames are received by default).

After clicking the "Start" button, the name of the button will change to "Stop". At the same time, results of received frames will be shown in the textbox on the right. Users can click the "Stop" button to stop receiving frames (100 frames are received by default) during the process, then the name of the button will return to "Start" for the next.

开始前，请在“CAN Port”文本框中输入已安装端口名，如 can0、can1 等。在“Baud Rate”下拉列表中选择想要的波特率值（默认值为 125 K）。在“Timeout”区域输入超时值（默认为 3000 ms）。选定“Self Receive”复选框启用自发自收功能。在 WDM 平台中，用户可选择“synchronous”（同步）或“asynchronous”（异步）模式。在 CE 平台中，仅支持“synchronous”模式。完成上述设置后，用户可点击“Start”按钮开始接收数据（默认发送 100 帧）。

点击“Start”按钮后，按钮名称变为“Stop”。同时帧接收结果也将显示在右边的文本框中。用户可在接收过程中点击“Stop”按钮停止帧接收（默认发送 100 帧），然后按钮名将重新变为“Start”，准备下一次接收。

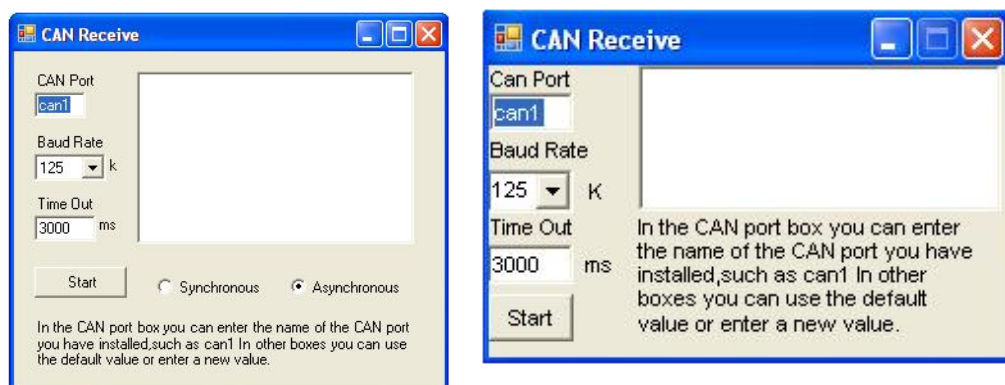


Figure B.3 CAN Receive test of WDM&CE/CAN WDM&CE 接收测试

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